

1. L. Andrews and G. C. Pimentel, "The Infrared Spectrum, Structure, and Bonding of Lithium Nitroxide, LiON," *J. Chem. Phys.* **1966**, *44*, 2361-2369.
2. L. Andrews and G. C. Pimentel, "The Infrared Detection of Methyl Radical in Solid Argon," *J. Chem. Phys.* **1966**, *44*, 2527-2528.
3. L. Andrews and G. C. Pimentel, "Visible Spectra of Lithium in Inert Gas Matrices," *J. Chem. Phys.* **1967**, *47*, 2905-2910.
4. L. Andrews and G. C. Pimentel, "Infrared Spectrum of the Methyl Radical in Solid Argon," *J. Chem. Phys.* **1967**, *47*, 3637-3644.
5. L. Andrews, "Infrared Spectrum of Methyl Lithium Monomer in Solid Argon," *J. Chem. Phys.* **1967**, *47*, 4834-4842.
6. L. Andrews, "Infrared Detection of Trichloromethyl Radical in Solid Argon," *J. Phys. Chem.* **1967**, *71*, 2761-2762.
7. L. Andrews, "Infrared Spectrum of the Trichloromethyl Radical in Solid Argon," *J. Chem. Phys.* **1967**, *48*, 972-979.
8. L. Andrews, "Infrared Spectrum of Dichlorocarbene in Solid Argon," *J. Chem. Phys.* **1968**, *48*, 979-982.
9. L. Andrews and T. G. Carver, "Infrared Spectral Evidence for Trihalomethyl Lithium and Sodium Compounds in Solid Argon," *J. Phys. Chem.* **1968**, *72*, 1743-1747.
10. L. Andrews and T. G. Carver, "Infrared Spectra and Bonding in the Tribromomethyl Radical and Dibromocarbene in Solid Argon," *J. Chem. Phys.* **1968**, *49*, 896-902.
11. L. Andrews, "On the Infrared Spectra of Dichlorocarbene and the Trichloromethyl Radical in Solid Argon," *Tet. Lett.* **1968**, *12*, 1423-1426.
12. L. Andrews, "Infrared Spectrum and Bonding in the Lithium Superoxide Molecule LiO<sub>2</sub>," *J. Am. Chem. Soc.* **1968**, *90*, 7368-7370.
13. T. G. Carver and L. Andrews, "Infrared Spectrum and Bonding in the Dibromomethyl Radical," *J. Chem. Phys.* **1969**, *50*, 4223-4234.
14. T. G. Carver and L. Andrews, "Infrared Spectrum and Bonding in the Dichloromethyl Radical," *J. Chem. Phys.* **1969**, *50*, 4235-4245.
15. L. Andrews, "Infrared Spectrum, Structure, Vibrational Potential Function and Bonding in the Lithium Superoxide Molecule LiO<sub>2</sub>," *J. Chem. Phys.* **1969**, *50*, 4288-4299.
16. T. G. Carver and L. Andrews, "Infrared Spectrum of the Difluoromethyl Radical in Solid Argon," *J. Chem. Phys.* **1969**, *50*, 5100-5107.

17. L. Andrews and D. L. Frederick, "Infrared Spectra of the Dichloro- and Dibromophosphinyl Radicals in Solid Argon," *J. Phys. Chem.* **1969**, *73*, 2774-2275.
18. L. Andrews, "Infrared Spectra and Bonding in the Sodium Superoxide and Sodium Peroxide Molecules," *J. Phys. Chem.* **1969**, *73*, 3922-3938.
19. L. Andrews and D. L. Frederick, "Infrared Spectra of the Germanium, Tin and Lead Dichloride Molecules in Solid Argon," *J. Am. Chem. Soc.* **1970**, *92*, 775-779.
20. L. Andrews and D. W. Smith, "Matrix Infrared Spectrum and Bonding in the Monochloromethyl Radical," *J. Chem. Phys.* **1970**, *53*, 2956-2966.
21. L. Andrews, "Matrix Reactions of K and Rb Atoms with Oxygen Molecules," *J. Chem. Phys.* **1971**, *54*, 4935-4943.
22. L. Andrews and J. I. Raymond, "Matrix Infrared Spectrum of the OF Radical and Detection of LiOF," *J. Chem. Phys.* **1971**, *55*, 3078-3086.
23. L. Andrews and J. I. Raymond, "Argon Matrix Infrared Spectrum of the ClO Radical," *J. Chem. Phys.* **1971**, *55*, 3087-3094.
24. D. W. Smith and L. Andrews, "Matrix Infrared Spectrum and Bonding in the Monobromomethyl Radical," *J. Chem. Phys.* **1971**, *55*, 5295-5303.
25. L. Andrews, "Infrared Spectra of Free Radicals and Chemical Intermediates in Inert Matrices," *Ann. Rev. Phys. Chem.* **1971**, *22*, 109-132.
26. J. I. Raymond and L. Andrews, "Matrix Reactions of Fluoromethanes with Alkali Metals: Infrared Spectrum and Bonding in the CH<sub>2</sub>F Radical," *J. Phys. Chem.* **1971**, *75*, 3235-3242.
27. D. F. Smith, Jr., J. Overend, R. C. Spiker, Jr. and L. Andrews, "Anharmonic Force Constants of N<sub>2</sub>O from Matrix Infrared Spectra," *Spectrochim. Acta* **1972**, *28A*, 87-93.
28. D. W. Smith and L. Andrews, "Anharmonic Potential Functions for the Out-of-plane Modes of CH<sub>2</sub>X Radicals," *Spectrochim. Acta* **1972**, *28A*, 493-499.
29. R. C. Spiker, Jr., L. Andrews, and C. Trindle, "Infrared Matrix and Theoretical Studies of the Reduction of Molecular Nitrogen by Lithium Atoms," *J. Am. Chem. Soc.* **1972**, *94*, 2401-2406.
30. D. A. Hatzenbuehler and L. Andrews, "Raman and Infrared Spectra of LiO<sub>2</sub> in Oxygen Matrices," *J. Chem. Phys.* **1972**, *56*, 3398-3403.
31. D. A. Hatzenbuehler, R. R. Smardzewski, and L. Andrews, "Computer Time Averaging of Laser Raman Spectra for Matrix Isolated Species," *Applied Spectry*, **1972**, *26*, 479-480.

32. L. Andrews, "Argon Matrix Raman Spectra of Oxygen Difluoride and the Oxygen Fluoride Free Radical," *J. Chem. Phys.* **1972**, *57*, 51-55.
33. R. R. Smardzewski and L. Andrews, "Raman Spectra of the Products of Na and K Atom Argon Matrix Reactions with O<sub>2</sub> Molecules," *J. Chem. Phys.* **1972**, *57*, 1327-1333.
34. D. W. Smith and L. Andrews, "Matrix Infrared Spectra and Bonding in the Diiodomethyl and Triiodomethyl Radicals," *J. Phys. Chem.* **1972**, *76*, 2718-2726.
35. L. Andrews and R. C. Spiker, Jr., "Argon Matrix Raman and Infrared Spectra of Ozone and the <sup>18</sup>O-substituted Ozone Molecules," *J. Phys. Chem.* **1972**, *76*, 3208-3213.
36. R. C. Spiker, Jr. and L. Andrews, "Matrix Reactions of Lithium Atoms with N<sub>2</sub>O: Infrared Spectra of LiO and Li<sub>2</sub>O," *J. Chem. Phys.* **1973**, *58*, 702-712.
37. R. C. Spiker, Jr. and L. Andrews, "Matrix Reactions of Na, K, Rb, and Cs Atoms with N<sub>2</sub>O: Infrared Spectra and Structures of K<sub>2</sub>O, Rb<sub>2</sub>O, and Cs<sub>2</sub>O," *J. Chem. Phys.* **1973**, *58*, 713-721.
38. R. R. Smardzewski and L. Andrews, "Raman Spectra of the Products of Rubidium and Cesium Atom Argon Matrix Reactions with O<sub>2</sub> Molecules," *J. Phys., Chem.* **1973**, *77*, 801-822.
39. L. Andrews, J. -T. Hwang, and C. Trindle, "Matrix Reactions of Cesium Atoms with Oxygen Molecules. Infrared Spectrum and Vibrational Analysis of Cs<sup>+</sup>O<sub>2</sub><sup>-</sup>," *J. Phys. Chem.* **1973**, *77*, 1065-1073.
40. L. Andrews and R. R. Smardzewski, "Argon Matrix Raman Spectrum of LiO<sub>2</sub>. Bonding in the M<sup>+</sup>O<sub>2</sub><sup>-</sup> Molecules and the Ionic Model," *J. Chem. Phys.* **1973**, *58*, 2258-2261.
41. W. F. Howard, Jr. and L. Andrews, "Resonance Raman Spectrum of the Matrix-Isolated Chlorine Molecular Anion, Cl<sub>2</sub><sup>-</sup>," *J. Amer. Chem. Soc.* **1973**, *95*, 2056-2058.
42. W. F. Howard, Jr. and L. Andrews, "Matrix Raman Spectrum of the Fluorine Molecular Anion, F<sub>2</sub><sup>-</sup>," *J. Amer. Chem. Soc.* **1973**, *95*, 3045-3046.
43. D. E. Tevault and L. Andrews "Matrix Infrared Spectrum and Evidence for Photoisomerism of Li<sup>+</sup>(ON)<sup>2-</sup>Li<sup>+</sup>," *J. Phys. Chem.* **1973**, *77*, 1640-1645.
44. D. E. Tevault and L. Andrews, "Matrix Reactions of Na, K, Rb, and Cs Atoms with Nitric Oxide," *J. Phys. Chem.* **1973**, *77*, 1646-1649.
45. L. Andrews, "Resonance Raman Spectrum of the Matrix Isolated Ozonide Ion in the Species M<sup>+</sup>O<sub>3</sub><sup>-</sup>," *J. Amer. Chem. Soc.* **1973**, *95*, 4487-4488.
46. D. W. Smith and L. Andrews, "Matrix Infrared Spectrum and Bonding in the Monoiodomethyl Radical," *J. Chem. Phys.* **1973**, *58*, 5222-5229.

47. R. C. Spiker, Jr. and L. Andrews, "Matrix Reactions of Alkali Metal Atoms with Ozone: Infrared Spectra of the Alkali Metal Ozonide Molecules," *J. Chem. Phys.* **1973**, *59*, 1851-1862.
48. L. Andrews and R. C. Spiker, Jr., "Resonance Raman Spectrum and Vibrational Analysis of the Ozonide Ion," *J. Chem. Phys.* **1973**, *59*, 1863-1871.
49. L. Andrews, "Infrared Spectra of Free Radicals and Chemical Intermediates in Inert Matrices," Ch. 5, pp. 179-201, in Vibrational Spectroscopy of Trapped Species, ed. H. E. Hallam, John Wiley, Sussex, England, **1973**.
50. F. K. Chi and L. Andrews, "Argon Matrix Raman Spectra of Cl<sub>2</sub>O and its Photolysis Products ClO and ClClO," *J. Phys. Chem.* **1973**, *77*, 3062-3067.
51. D. W. Smith and L. Andrews, "Argon Matrix Infrared Spectra and Vibrational Analysis of the Hydroperoxyl and Deuteroperoxyl Free Radicals," *J. Chem. Phys.* **1974**, *60*, 81-85.
52. D. E. Tevault and L. Andrews, "Laser Raman Studies of Nitrogen Dioxide. Resonance Raman Spectrum of NO<sub>2</sub> and Raman Spectrum of N<sub>2</sub>O<sub>4</sub>," *Spectrochim. Acta* **1974**, *30A*, 969-975.
53. D. M. Thomas and L. Andrews, "Matrix Reactions of Alkaline Earth Metal Atoms with Ozone. Infrared Spectra of the Metal Ozonide and Metal Oxide Molecules," *J. Mol. Spectrosc.* **1974**, *50*, 220-234.
54. L. Andrews, F. K. Chi and A. Arkell, "Matrix Infrared Spectrum and Vibrational Analysis of the FCIO Intermediate," *J. Amer. Chem. Soc.* **1974**, *96*, 1997-2000.
55. D. E. Tevault, F. K. Chi, and L. Andrews, "Infrared Spectrum and Vibrational Potential Function of the Chlorite Anion in the Matrix Isolated M<sup>+</sup>ClO<sub>2</sub><sup>-</sup> Species," *J. Mol. Spectrosc.* **1974**, *51*, 450-457.
56. F. K. Chi and L. Andrews, "Resonance Raman and Fluorescence Spectra of Chlorine Dioxide in Argon, Krypton, Xenon and Nitrogen Matrices at 16 K," *J. Mol. Spectrosc.* **1974**, *52*, 82-93.
57. W. F. Howard, Jr. and L. Andrews, "Matrix Raman Spectra of the Molecular Halogens. Resonance Raman Spectra of Isolated and Aggregated I<sub>2</sub>," *J. Raman Spectrosc.* **1974**, *2*, 447-462.
58. L. Andrews, R. O. Allen, and J. M. Grzybowski, "Proton Beam Irradiation of Matrix Samples: New Technique for the Study of Infrared Spectra of Positive Ions," *J. Chem. Phys.* **1974**, *61*, 2156-2157.
59. W. F. Howard, Jr., and L. Andrews, "Synthesis of Noble-Gas Dihalides by Laser Photolysis of Matrix-Isolated Halogens," *J. Amer. Chem. Soc.* **1974**, *96*, 7864-1868.

60. B. S. Ault and L. Andrews, "Matrix Reactions of Alkaline Earth Metal Atoms with Oxygen Molecules: Infrared Spectra of the Metal Superoxide and Metal Oxide Dimer Species," *J. Chem. Phys.* **1975**, *62*, 2312-2319.
61. B. S. Ault and L. Andrews, "Nitrogen Matrix Reactions of Alkaline Earth Metal Atoms with Ozone: Infrared Spectra of the Alkaline Earth Metal Oxide Molecules," *J. Chem. Phys.* **1975**, *62*, 2320-2327.
62. D. E. Tevault and L. Andrews, "Ultraviolet Laser-Induced Fluorescence Spectrum of Fluorochlorocarbene in Solid Argon," *J. Mol. Spectrosc.* **1975**, *54*, 54-63.
63. D. E. Tevault and L. Andrews, "Laser Induced Fluorescence Spectrum of Argon Matrix-Isolated Dichlorocarbene," *J. Mol. Spectrosc.* **1975**, *54*, 110-119.
64. D. Hatzenbuehler, L. Andrews and F. A. Carey, "Matrix Reactions of Alkali Metal Atoms with Tetrahalomethanes, Evidence for a Novel Carbenoid," *J. Amer. Chem. Soc.* **1975**, *97*, 187-189.
65. L. Andrews and D. E. Tevault, "On the Mechanism of  $M^+O_3^-$  Formation by Photolysis of Matrix Samples at 15 K," *J. Mol. Spectrosc.* **1975**, *55*, 452-459.
66. L. Andrews, B. S. Ault, J. M. Grzybowski and R. O. Allen, "Proton and Deuteron Radiolysis of Argon Matrix Samples of  $O_2$  and  $C_{12}$ . Infrared Spectra of Charged Species," *J. Chem. Phys.* **1975**, *62*, 2461-2464.
67. W. F. Howard, Jr. and L. Andrews, "Infrared and Raman Studies of Alkali Metal Atom Matrix Reactions with Fluorine. Vibrational Spectrum of the  $M^+F_2^-$  Species," *Inorg. Chem.* **1975**, *14*, 409-413.
68. W. F. Howard, Jr. and L. Andrews, "Infrared and Raman Studies of Alkali Metal - Chlorine Reaction Products. Resonance Raman Spectrum of the Chlorine Molecular Anion,  $Cl_2^-$ " *Inorg. Chem.* **1975**, *14*, 767-771.
69. D. E. Tevault and L. Andrews, "Laser-Induced Fluorescence Studies of Alkali Metal Atom - Carbon Tetrahalide Matrix Reaction Products. Fluorescence Spectra of  $CBr_2$  and  $CClBr$  in Solid Argon at 15 K," *J. Amer. Chem. Soc.* **1975**, *97*, 1707-1710.
70. W. F. Howard, Jr. and L. Andrews, "Raman Spectra of Alkali Metal - Iodine Matrix Reaction Products. Resonance Raman Spectrum of the Iodine Molecular Anion,  $I_2^-$ ," *J. Amer. Chem. Soc.* **1975**, *97*, 2956-2959.
71. B. S. Ault, W. F. Howard, Jr., and L. Andrews, "Laser - Induced Fluorescence and Raman Spectra of Chlorine and Bromine Molecules Isolated in Inert Matrices," *J. Mol. Spectrosc.* **1975**, *55*, 217-228.

72. C. A. Wight, B. S. Ault, and L. Andrews, "Laser-Induced Fluorescence and Resonance Raman Spectra of Interhalogen Diatomics Isolated in Inert Matrices at 12 K," *J. Mol. Spectrosc.* **1975**, *56*, 239-250.
73. R. O. Allen, J. M. Grzybowski, and L. Andrews, "Proton Beam Radiolysis of Matrix Samples: A New Technique for Infrared Spectroscopic Study of Charged Molecular Intermediates," *J. Phys. Chem.* **1975**, *79*, 898-904.
74. L. Andrews, J. M. Grzybowski, and R. O. Allen, "Infrared Spectra of the Molecular Ions and Radicals Produced by Proton Radiolysis of Carbon Tetrachloride in Argon during Condensation at 15 K," *J. Phys. Chem.* **1975**, *79*, 904-912.
75. W. F. Howard, Jr. and L. Andrews, "Resonance Raman Spectrum of Matrix – Isolated  $(\text{ReCl}_3)_3$ ," *Inorg. Chem.* **1975**, *14*, 1726-1728.
76. B. S. Ault and L. Andrews, Salt – Molecule Matrix Reactions. "Infrared Spectra of the  $\text{M}^+\text{HCl}_2^-$  and  $\text{M}^+\text{Cl}_3^-$  Ion Pairs in Solid Argon," *J. Amer. Chem. Soc.* **1975**, *97*, 3824-3826.
77. J. M. Grzybowski and L. Andrews, "Resonance Raman Effect in Matrix Isolated Photolytically Produced Monomeric Iodine: An Investigation of the Excitation Profiles of the Overtone," *J. Raman Spectrosc.* **1975**, *4*, 99-113.
78. B. S. Ault and L. Andrews, "Proton Radiolysis of  $\text{CHCl}_3$  and  $\text{CHBr}_3$  at High Dilution in Argon during Condensation at 15 K. Infrared Spectra of the  $\text{CHX}_2^+$ ,  $\text{CHX}_2^-$  and  $\text{CHX}_3^-$  Molecular Ions," *J. Chem. Phys.* **1975**, *63*, 1411-1418.
79. B. S. Ault and L. Andrews, "Matrix Reactions of Alkali Metal Chloride Salts and HCl and DCl: Infrared Spectra of the  $\text{M}^+\text{HCl}_2^-$  and  $\text{M}^+\text{DCl}_2^-$  Ion Pairs," *J. Chem. Phys.* **1975**, *63*, 2466-2472.
80. L. Andrews, "Vibronic Spectra of the Ozonide Ion in the Matrix-Isolated  $\text{M}^+\text{O}_3^-$  Species," *J. Chem. Phys.* **1975**, *63*, 4465-4469.
81. L. Andrews, "Infrared and Raman Spectroscopic Studies of Alkali-Metal Atom Matrix-Reaction Products," Ch. 6, pp. 195-229 in *Cryochemistry*, ed. M. Moskovits and G. A. Ozin, Wiley-Interscience, New York, **1976**.
82. L. Andrews, "Laser-Excitation Matrix-Isolation Spectroscopy," *Applied Spectroscopy. Reviews* **1976**, *11*, 125-161.
83. B. S. Ault and L. Andrews, "Infrared Spectra of the  $\text{M}^+\text{HBr}_2^-$  and  $\text{M}^+\text{HClBr}^-$  Ion Pairs and their Deuterium Analogs Isolated in Argon Matrices at 15 K," *J. Chem. Phys.* **1976**, *64*, 1986-1993.
84. B. S. Ault and L. Andrews, "Absorption and Emission Spectra of Argon Matrix - Isolated XeF and KrF," *J. Chem. Phys.* **1976**, *64*, 3075-3076.

85. B. S. Ault and L. Andrews, "Matrix Reactions of Alkali Metal Fluoride Molecules with Fluorine. Infrared and Raman Spectra of the Trifluoride Ion in the  $M^+F_3^-$  Species," *J. Am. Chem. Soc.* **1976**, *98*, 1591-1593.
86. L. Andrews, "Optical Spectra of the Difluoride, Dichloride and Trichloride Ions in the Matrix-Isolated  $M^+F_2^-$ ,  $M^+Cl_2^-$  and  $M^+Cl_3^-$  Species," *J. Amer. Chem. Soc.* **1976**, *98*, 2147-2152.
87. L. Andrews, "Optical Spectra of the Dibromide and Diiodide Ions in the Matrix-Isolated  $M^+Br_2^-$  and  $M^+I_2^-$  Species," *J. Amer. Chem. Soc.* **1976**, *98*, 2152-2156.
88. B. S. Ault and L. Andrews, "Infrared and Raman Spectra of the  $M^+Cl_3^-$  Ion Pairs and their Chlorine-Bromine Counterparts Isolated in Argon Matrices," *J. Chem. Phys.* **1976**, *64*, 4853-4859.
89. L. Andrews, "Ultraviolet Absorption Studies of the Alkali Metal Atom-Oxygen Molecule Matrix Reaction," *J. Mol. Spectrosc.* **1976**, *61*, 337-345.
90. C. A. Wight, B. S. Ault, and L. Andrews, "On Microwave Discharge Sources of New Chemical Species for Matrix Isolation Spectroscopy and the Identification of Charged Species," *J. Chem. Phys.* **1976**, *65*, 1244-1249.
91. C. A. Wight, B. S. Ault, and L. Andrews, "Laser-Raman and Emission Spectra of the Dibromide Molecular Anion in the  $M^+Br_2^-$  Species," *Inorg. Chem.* **1976**, *15*, 2147-2152.
92. B. S. Ault and L. Andrews, "Absorption and Emission Spectra of Matrix-Isolated XeF, KrF, XeCl and XeBr," *J. Chem. Phys.* **1976**, *65*, 4192-4201.
93. B. S. Ault and L. Andrews, "Absorption Spectroscopic Evidence for Argon Matrix-Isolated XeO," *Chem. Phys. Letts.* **1976**, *43*, 350-351.
94. B.S. Ault, D. E. Tevault, and L. Andrews, "Laser-Induced Evidence for Alkali Metal Atom-Noble Gas Molecules," *J. Chem. Phys.* **1977**, *66*, 1383-1385.
95. E. S. Prochaska and L. Andrews, "Raman, Infrared and Ultraviolet Spectra of the Chlorine Difluoride Free Radical in Solid Nitrogen," *Inorg. Chem.* **1977**, *16*, 339-343.
96. B. S. Ault, L. Andrews, D. W. Green, and G. T. Reedy, "A Search for the Infrared Fundamental Matrix-Isolated XeF," *J. Chem. Phys.* **1977**, *66*, 2786-2788.
97. B. S. Ault and L. Andrews, "Ultraviolet Absorption Spectra of  $Zn_2$  and  $Cd_2$  in Solid Argon and Krypton at 10 K," *J. Mol. Spectrosc.* **1977**, *65*, 102-108.
98. M. A. Goetschalckx, R. L. Mowery, E. R. Krausz, W. C. Yeakel, P. N. Schatz, B. S. Ault, and L. Andrews, "Magnetic Circular Dichroism of Matrix Isolated Noble Gas Monohalides," *Chem. Phys. Lett.* **1977**, *47*, 23-27.

99. B. S. Ault and L. Andrews, "Visible Absorption and Resonance Raman Spectra of Alkaline Earth Metal Ozonides," *J. Mol. Spectrosc.* **1977**, *65*, 437-445.
100. D. E. Tevault and L. Andrews, "Infrared Spectra of  $\text{Ca}^+\text{NO}^-$  and  $\text{Ca}^+\text{NO}_2^-$  in Solid Argon at 15 K," *Chem. Phys. Letts.* **1977**, *48*, 103-106.
101. E. S. Prochaska, B. S. Ault, and L. Andrews, "Infrared, Raman Ultraviolet Spectra of  $\text{M}^+\text{ClF}^-$  Species in Solid Argon," *Inorg. Chem.* **1977**, *16*, 2021-2023.
102. B. S. Ault and L. Andrews, "Infrared and Raman Spectra of the  $\text{M}^+\text{F}_3^-$  Ion Pairs and their Mixed Chlorine-Fluorine Counterparts in Solid Argon," *Inorg. Chem.* **1977**, *16*, 2024-2028.
103. F. T. Prochaska and L. Andrews, "Matrix Photodissociation and Photoionization of Carbon Tetrahalides with Noble Gas Resonance Radiation," *J. Chem. Phys.* **1977**, *67*, 1091-1098.
104. F. T. Prochaska and L. Andrews, "Vibration-rotational and Pure Rotational Laser-Raman Spectra of  $\text{H}_2$ ,  $\text{D}_2$  and  $\text{HD}$  in Matrices at 12 K," *J. Chem. Phys.* **1977**, *67*, 1139-1143.
105. J. C. Miller and L. Andrews, "Absorption and Emission Spectra of  $\text{Ca}_2$  in Solid Krypton," *Chem. Phys. Letts.* **1977**, *50*, 315-319.
106. L. Andrews and B. S. Ault, "Infrared Spectra of Matrix-Isolated Calcium-44 Substituted Oxides," *J. Mol. Spectrosc.* **1977**, *68*, 114-121.
107. J. C. Miller, B. S. Ault, and L. Andrews, "Absorption Spectra of Matrix-Isolated Alkaline Earth Metal Diatomic Molecules," *J. Chem. Phys.* **1977**, *67*, 2478-2487.
108. L. Andrews, "Spectroscopy of Transient Species and Molecular Ions in Matrices," *Ber. Bunsenges.* **1978**, *82*, 65-68.
109. J. C. Miller and L. Andrews, "One-photon and Consecutive Two-photon Excitation of  $\text{Ca}_2$  Fluorescence in a Solid Krypton at 12 K," *J. Chem. Phys.* **1978**, *68*, 1701-1707.
110. F. T. Prochaska and L. Andrews, "Matrix Photoionization Studies of Trifluoromethyl Halide Systems. Infrared Spectra of  $\text{CF}_3^+$ ,  $\text{CF}_2\text{X}^+$  and  $\text{CF}_3\text{X}^+$  Cations in Solid Argon," *J. Amer. Chem. Soc.* **1978**, *100*, 2102-2108.
111. E. S. Prochaska, L. Andrews, N. R. Smyrl, and G. Mamantov, "Matrix Reactions of Fluorine with Chlorine, Bromine and Iodine. Infrared Detection of  $\text{XF}_2$ ,  $\text{X}_2\text{F}_2$ , and  $\text{X}_2\text{F}$  Species," *Inorg. Chem.* **1978**, *17*, 970-977.
112. L. Andrews, D. E. Tevault, and R. R. Smardzewski, "Spectral Evaluation of Windowless Argon Discharge Vacuum Ultraviolet Lamps for Matrix Isolation Spectroscopy," *Appl. Spectrosc.* **1978**, *32*, 157-160.



113. J. C. Miller and L. Andrews, "Laser Photoluminescence Spectra of  $^{24}\text{Mg}_2$  and  $^{26}\text{Mg}_2$  in Solid Argon at 12K," *J. Am. Chem. Soc.* **1978**, *100*, 2966-2970.
114. L. Andrews, W. W. Duley, and L. Brewer, "Optical Spectra of Calcium Atoms in Inert Matrices: A New Red Absorption for  $\text{Ca}_2$ ," *J. Mol. Spectrosc.* **1978**, *70*, 41-52.
115. B. S. Ault and L. Andrews, "Laser Photoluminescence of Iodine Matrix Samples: Spectroscopic Evidence for Several  $(\text{I}_2)_2$  Species," *J. Mol. Spectrosc.* **1978**, *70*, 68-73.
116. J. M. Grzybowski and L. Andrews, "Ultraviolet-Laser Induced Fluorescence of  $\text{UF}_6$  Isolated in Argon Matrices," *J. Chem. Phys.* **1978**, *68*, 4540-4545.
117. F. T. Prochaska and L. Andrews, "Matrix Radiolysis and Photoionization of  $\text{CFCl}_3$ . Infrared Spectra of  $\text{CFCl}_2^+$  and the Parent Cation," *J. Chem. Phys.* **1978**, *68*, 5568-5576.
118. F. T. Prochaska and L. Andrews, "Matrix Radiolysis and Photoionization of  $\text{CF}_2\text{Cl}_2$  and  $\text{CF}_3\text{Cl}$ . Infrared Spectra of  $\text{CF}_2\text{Cl}^+$  and the Parent Cations," *J. Chem. Phys.* **1978**, *68*, 5577-5586.
119. F. T. Prochaska and L. Andrews, "Matrix Photoionization and Radiolysis of the Fluorobromomethanes. Infrared Spectra and Photochemistry of  $\text{CFBr}_2^+$ ,  $\text{CF}_2\text{Br}^+$ ,  $\text{CF}_3^+$ , and the Parent Cations," *J. Phys. Chem.* **1978**, *82*, 1731-1774.
120. L. Andrews, E. S. Prochaska, and B. S. Ault, "Matrix Reactions of Magnesium Atoms with Ozone. Infrared Spectra of  $\text{MgO}$ ,  $\text{MgO}_2$ , and  $\text{MgO}_3$  in Solid Nitrogen," *J. Chem. Phys.* **1978**, *69*, 556-563.
121. J. C. Miller and Andrews, "Laser Excited Emission Spectra of  $\text{Sr}_2$  Isolated in Rare Gas Matrices at 12 K," *J. Chem. Phys.* **1978**, *69*, 936-938.
122. J. C. Miller and Andrews, "Laser-excited Fluorescence of Calcium Dimer in Inert Gas Matrices," *J. Chem. Phys.* **1978**, *69*, 2054-2063.
123. C. A. Wight, H. Willner, and L. Andrews, "Laser Photoluminescence Spectra of the  $\text{M}^+\text{S}_2^-$  Species in Solid Argon at 12 K," *J. Mol. Spectrosc.* **1978**, *72*, 332-341.
124. C. A. Wight and L. Andrews, "Matrix Reactions of Dichlorodisulfane with Alkali Metals, Blue Absorption Spectrum of the  $\text{S}_2\text{Cl}$  Radical in Solid Argon at 20 K," *J. Mol. Spectrosc.* **1978**, *72*, 342-348.
125. J. C. Miller and L. Andrews, "Absorption Spectra of Heteronuclear Group II Metal Diatomic Molecules in Solid Argon at K," *J. Chem. Phys.* **1978**, *69*, 3034-3038.
126. L. Andrews, C. A. Wight, F. T. Prochaska, S. A. McDonald, and B. S. Ault, "Vacuum-Ultraviolet Photoionization of Bromoform and Its Chlorine Substituted Counterparts During Condensation With Argon at 15 K, Infrared Spectra of the  $(\text{CHX}_2^+)\text{X}$  and  $\text{X}^- \text{HCX}_2$  Molecular Ions," *J. Mol. Spectrosc.* **1978**, *73*, 120-143.

127. J. C. Miller and L. Andrews, "Laser Photoluminescence of Matrix-Isolated CaMg, SrMg, and SrCa in Solid Argon at 12 K," *J. Am. Chem. Soc.* **1978**, *100*, 6956-6960.
128. L. Andrews, F. T. Prochaska, and B.S. Ault, "Matrix Photoionization and Radiolysis of CH<sub>2</sub>Cl<sub>2</sub> and CH<sub>2</sub>Br<sub>2</sub>. Infrared and Ultraviolet Absorption Spectra and Photolysis of CH<sub>2</sub>Cl<sub>2</sub><sup>+</sup> and CH<sub>2</sub>Br<sub>2</sub><sup>+</sup>," *J. Am. Chem. Soc.* **1979**, *101*, 9-15.
129. L. Andrews and F. T. Prochaska, "Absorption Spectra and Photochemistry of the Chlorofluoro- and Bromofluoromethane Cations in Solid Argon," *J. Phys. Chem.* **1979**, *83*, 368-372.
130. L. Andrews, H. Willner, and F. T. Prochaska, "A Simple Synthesis for Carbon-13 Enriched Fluorochloromethanes and Fluoromethanes," *J. Fluorine Chem.* **1979**, *13*, 273-278.
131. L. Andrews and F. T. Prochaska, "Infrared Spectrum of the Intramolecular Hydrogen-bonded Chloroform Anion Cl<sup>-</sup>-HCCl<sub>2</sub> in Solid Argon at 15 K," *J. Am. Chem. Soc.* **1979**, *101*, 1190-1196.
132. M. H. Andrews and L. Andrews, "First-Year Chemistry Grades and SAT Math Scores," *J. Chem. Ed.* **1979**, *56*, 231-232.
133. S. A. McDonald and L. Andrews, "Infrared Spectrum and Structure of the Isolated HF<sub>2</sub><sup>-</sup> Ion in Solid Argon," *J. Chem. Phys.* **1979**, *70*, 3134-3136.
134. R. L. Mowery, J. C. Miller, E. R. Krausz, P. N. Schatz, S. M. Jacobs, and L. Andrews, "Magnetic Circular Dichroism of the <sup>1</sup>S → <sup>1</sup>P Transition of Mg Atoms in Noble Gas Matrices," *J. Chem. Phys.* **1979**, *70*, 3920-3926.
135. J. C. Miller, S. W. Allison, and L. Andrews, "Laser Spectroscopy of Matrix-Isolated UF<sub>6</sub> at 12 K," *J. Chem. Phys.* **1979**, *70*, 3524-3530.
136. L. Andrews and F. T. Prochaska, "Infrared Spectra of the Intramolecular Hydrogen-Bonded Difluorohaloform Anions in Solid Argon," *J. Phys. Chem.* **1979**, *83*, 824-831.
137. J. H. Miller and L. Andrews, "Infrared Spectra of the M<sup>+</sup>BrF<sub>2</sub><sup>-</sup> and M<sup>+</sup>IF<sub>2</sub><sup>-</sup> Ions Pairs in Solid Argon," *Inorg. Chem.* **1979**, *18*, 988-992.
138. L. Andrews, Coblenz Award Address, "Spectroscopy of Transient Species and Molecular Ions in Matrices," *Appl. Spectrosc.* **1979**, *33*, 199-205.
139. L. Andrews and F. T. Prochaska, "Infrared Spectra of the CH<sub>2</sub>F<sub>2</sub><sup>+</sup>, CHF<sub>2</sub><sup>+</sup>, CHF<sup>+</sup> and FH-(CHF)<sup>-</sup> Molecular Ions in Solid Argon," *J. Chem. Phys.* **1979**, *70*, 4714-4723.
140. F. T. Prochaska, B. W. Keelan, and L. Andrews, "Infrared Spectra of the CHFCl, CHFBr and CHFI Free Radicals in Solid Argon," *Mol. Spectrosc.* **1979**, *76*, 142-152.

141. L. Andrews and B. W. Keelan, "Infrared Spectra, Structure and Bonding in the Dihalocarbene Cations in Solid Argon," *J. Am. Chem. Soc.* **1979**, *101*, 3500- 3505.
142. B. W. Keelan and L. Andrews, "Matrix Photoionization of Dihalo-fluoromethanes. Infrared Spectra of Parent and Daughter Cations and Intramolecular Hydrogen-Bonded Parent Anions in Solid Argon at 15 K," *J. Phys. Chem.* **1979**, *83*, 2488-2496.
143. L. Andrews, "Spectroscopy of Molecular Ions in Noble Gas Matrices," *Ann. Rev. Phys. Chem.* **1979**, *30*, 79-101.
144. L. Andrews, J. H. Miller, and E. S. Prochaska, "Matrix Photoionization of Methyl Halides Ultraviolet Spectra of the Parent Cations and Infrared Evidence for Intramolecular Hydrogen-Bonded Parent Anions in Solid Argon," *J. Am. Chem. Soc.* **1979**, *101*, 7158-7161.
145. J. C. Miller and L. Andrews, "The  $b^1\Sigma^+ \rightarrow X^3\Sigma^-$  Transitions of NI, NBr and NCl in Solid Argon at 12 K," *J. Chem. Phys.* **1979**, *71*, 5276-5286.
146. J. C. Miller and L. Andrews, "Emission and Excitation Spectra of IF in Solid Argon at 12 K," *J. Mol. Spectrosc.* **1980**, *80*, 178-184.
147. J. C. Miller and L. Andrews, "Emission Spectrum of Fluorobromocarbene in Solid Argon," *J. Phys. Chem.* **1980**, *84*, 401-403.
148. L. Andrews, E. S. Prochaska, and A. Loewenschuss, "Resonance Raman and Ultraviolet Absorption Spectra of the Triiodide Ion," *Inorg. Chem.* **1980**, *19*, 463-465.
149. A. Loewenschuss, J. C. Miller, and L. Andrews, "Argon Matrix Absorption Spectra of ClO, BrO and IO and Emission Spectra of IO," *J. Mol. Spectrosc.* **1980**, *80*, 351-362.
150. S. A. McDonald, G. L. Johnson, B. W. Keelan, and L. Andrews, "Infrared Spectra of Hydrogen-Bonded Pi Complexes Between Hydrogen, Halides and Acetylene," *J. Am. Chem. Soc.* **1980**, *102*, 2892-2896.
151. Andrews, J. H. Miller, and B. W. Keelan, "Absorption Spectra and Photochemistry of the Toluene Cation and Benzyl Radical in Solid Argon," *Chem. Phys. Lett.* , **1980**, *71*, 207-210.
152. J. H. Miller and L. Andrews, "Fluorescence Spectrum of the Benzene Radical Cation in Solid Argon," *Chem. Phys. Lett.* **1980**, *72*, 90-93.
153. L. Andrews, "Spectroscopy of Molecular Ions in Noble Gas Matrices," **1980**, Ch. 2 in Vol. 7, Advances in Infrared and Raman Spectroscopy, ed. R.J. H. Clark and R. E. Hester, Heyden, London.
154. E. S. Prochaska and L. Andrews, "Infrared, Raman and Visible Spectroscopic Studies of Zn and Cd Matrix Reactions with Ozone," *J. Chem. Phys.* **1980**, *72*, 6782-6793.

155. J. H. Miller and L. Andrews, "Matrix Photoionization and Radiolysis of Boron Trihalides. Infrared and Ultraviolet Spectra of  $\text{BCl}_3^+$  and  $\text{BBr}_3^+$  and Infrared Spectra of  $\text{BCl}_2$  and  $\text{BBr}_2$ ," *Am. Chem. Soc.* **1980**, *102*, 4900-4906.
156. S. A. McDonald and L. Andrews, "Matrix Reactions of Zn, Cd and Mg Atoms with  $\text{NO}_2$ ," *J. Mol. Spectrosc.* **1980**, *82*, 455-458.
157. F. T. Prochaska and L. Andrews, "Infrared and Visible Absorption Spectra and Photochemistry of the  $\text{CH}_2\text{FX}^+$ ,  $\text{CHF}_2^+$ ,  $\text{F-H}(\text{CHX})^-$  and  $\text{X-H}(\text{CHF})^-$  Molecular Ions in Solid Argon," *J. Chem. Phys.* **1980**, *73*, 2651-2664.
158. L. Andrews and B. W. Keelan, "Absorption Spectra and Photo-chemical Rearrangement of Cycloheptatriene Cation to Toluene Cation in Solid Argon," *J. Am. Chem. Soc.* **1980**, *102*, 5732-5736.
159. G. L. Johnson and L. Andrews, "Reactions of Fluorine with Methane Upon Photolysis and Diffusion in Solid Argon. Infrared Spectra of HF Hydrogen-Bonded Complexes," *J. Am. Chem. Soc.* **1980**, *102*, 5736-5741.
160. J. C. Miller and L. Andrews, "Absorption and Laser-Excited Fluorescence Spectra of Matrix-Isolated Metal van der Waals Dimers," *Appl. Spectrosc. Rev.* **1980**, *16*, 1-42.
161. J. H. Miller, L. Andrews, P. A. Lund, and P. N. Schatz, "Argon Matrix Photolysis and Photoionization Studies of Benzene," *J. Chem. Phys.* **1980**, *73*, 4932-4939.
162. L. Andrews and B. W. Keelan, "Ultraviolet Absorption Spectra and Photochemical Rearrangements of Benzyl and Tropylium Cations in Solid Argon," *J. Am. Chem. Soc.* **1981**, *103*, 99-103.
163. B. W. Keelan and L. Andrews, "Visible Spectra and Rearrangements of Halotoluene Parent Cations in Solid Argon," *J. Chem. Soc.* **1981**, *103*, 822-829.
164. B. W. Keelan and L. Andrews, "Visible Absorption Spectra and Two-Photon Dissociation of Halobenzene Cations in Solid Argon," *J. Am. Chem. Soc.* **1981**, *103*, 829-832.
165. C. K. Kohlmeier and L. Andrews, "Infrared Spectrum of the Primary Ozonide of Ethylene in Solid Xenon," *J. Chem. Soc.* **1981**, *103*, 2578-2583.
166. B. J. Kelsall and L. Andrews, "Infrared Observations of Perfluoropropene Cation in Solid Argon," *J. Phys. Chem.* **1981**, *85*, 1288-1291.
167. J. C. Miller, R. L. Mowery, E. R. Krausz, S. M. Jacobs, H. W. Kim, P. N. Schatz, and L. Andrews, "Magnetic Circular Dichroism Spectra of Alkaline Earth Metal Atoms, Dimers, and Aggregates in Noble Gas Matrices," *J. Chem. Phys.* **1981**, *74*, 6349-6361.
168. R. O. Carter, III and L. Andrews, "Matrix Spectroscopic Studies of Chlorine Atom-Ozone Reaction Products," *J. Phys. Chem.* **1981**, *85*, 2351-2354.

170. L. Andrews, J. A. Harvey, B. J. Kelsall and D. C. Duffey, "Absorption Spectra and Photochemical Rearrangements in Phenyl Alkene Cations in Solid Argon," *J. Am. Chem. Soc.* **1981**, *103*, 6415-6422.
171. B. J. Kelsall and L. Andrews, "Surface Electric Discharge During Sample Condensation. New Method for Producing and Trapping Molecular Ions," *J. Phys. Chem.* **1981**, *85*, 2938-2941.
172. L. Andrews and T. Blankenship, "Vibronic Spectra of Naphthalene and Naphthalene-d<sub>8</sub> Cations in Solid Argon," *J. Am. Chem. Soc.* **1981**, *103*, 5977-5979.
173. J. H. Miller and L. Andrews, "Emission and Excitation Spectra of Benzyl Radicals in Solid Argon," *J. Mol. Spectrosc.* **1981**, *90*, 20-26.
174. J. H. Miller and L. Andrews, "Matrix Spectroscopy of the Argon Resonance Photolysis Products of Group IV Chlorides," *J. Mol. Struct.* **1981**, *77*, 65-73.
175. L. Andrews and G. L. Johnson, "Infrared Spectra of the CO<sub>2</sub>--HF and N<sub>2</sub>O--HF Complexes in Solid Argon," *J. Chem. Phys.* **1982**, *76* 2875-2880.
176. A. C. Puiu, L. Andrews, W. A. Chupka, and S. D. Colson, "Vibronic Absorption Spectra of the Biphenyl and Biphenyl-d<sub>10</sub> Cations in solid Argon," *J. Chem. Phys.* **1981**, *76*, 3854-3859.
177. C. K. Kohlmeier and L. Andrews, "Matrix Infrared Spectra of the NCl<sub>2</sub> and NBr<sub>2</sub> Free Radicals," *Inorg. Chem.* **1982**, *21*, 1519-1522.
178. L. Andrews and G. L. Johnson, "Matrix Infrared Spectrum of the H<sub>3</sub>N—HF Hydrogen-Bonded Complex," *J. Am. Chem. Soc.* **1982**, *104*, 3043-3047.
179. L. Andrews, "Matrix-Isolation," pp. 266-268 in McGraw-Hill Encyclopedia of Science and Technology, McGraw-Hill, New York, April **1982**.
180. B. J. Kelsall and L. Andrews, "Two-Color Resonance Photoionization of Aromatic Molecules in Solid Argon," *J. Chem. Phys.* **1982**, *76*, 5005-5013.
181. L. Andrews, G. L. Johnson, and B. J. Kelsall, "Infrared Spectra of the Hydrogen-Bonded Pi Complex C<sub>2</sub>H<sub>4</sub>--HX and in Solid Argon," *J. Chem. Phys.* **1982**, *76*, 5767-5773.
182. L. Andrews, B. J. Kelsall, and T. A. Blankenship, "Vibronic Absorption Spectra of Naphthalene and Substituted Naphthalene Cations in Solid Argon," *J. Phys. Chem.* **1982**, *86*, 2916-2926.
183. L. Andrews, G. L. Johnson, and B. J. Kelsall, "Fourier-Transform Infrared Spectra of the C<sub>2</sub>H<sub>2</sub>--HX Hydrogen-Bonded Complexes in Solid Argon," *J. Phys. Chem.* **1982**, *86*, 3374-3380.

184. L. Andrews and G. L. Johnson, "Fourier-Transform Infrared Spectra of Substituted-Alkyne Hydrogen-Bonded Complexes in Solid Argon," *J. Phys. Chem.* **1982**, *86*, 3380-3385.
185. M. Hawkins, C. K. Kohlmiller, and L. Andrews, "Matrix Infrared Spectra, Photolysis and Pyrolysis of Isotopic Secondary Ozonides of Ethylene," *J. Phys. Chem.* **1982**, *86*, 3154-3166.
186. L. Andrews, B. J. Kelsall, and J. Harvey, "Vibronic Absorption Spectra of Phenyl Alkyne Cations in Solid Argon at 20 K," *Chem. Phys.* **1982**, *77*, 2235-2241.
187. L. Andrews, G. L. Johnson and B. J. Kelsall, "Fourier-Transform Infrared Matrix Spectra of Substituted Alkene-Hydrogen Fluoride Complexes," *J. Am. Chem. Soc.* **1982**, *104*, 6180-6186.
188. L. Andrews, B. J. Kelsall, C. K. Payne, O. R. Rodig and H. Schwarz, "Absorption Spectra and Photochemical Rearrangements of 1-, 2-, and 3- Chlorocycloheptatriene, 7-Chloronorborene and Benzyl Chloride Cations in Solid Argon," *J. Phys. Chem.* **1982**, *86*, 3714-3721.
189. D. Pullin and L. Andrews, "The Absorption Spectra of the Phenoxy Radical in Solid Argon," *J. Mol. Struct.* **1982**, *95*, 181-185.
190. L. Andrews and C. K. Kohlmiller, "Infrared Spectra and Photochemistry of the Primary and Secondary Ozonides of Propene, trans-2-Butene and Methyl Propene in Solid Argon," *J. Phys. Chem.* **1982**, *86*, 4548-4557.
191. P. A. Lund, Z. Hasan, P. N. Schatz, J. H. Miller, and L. Andrews, "Matrix Isolation Magnetic Circular Dichroism Spectrum of NH Radical Produced by a Glow Discharge Technique," *Chem. Phys. Letts.* **1982**, *91*, 437-439.
192. G. L. Johnson and L. Andrews, "Infrared Spectra of Two 1:1 Complexes between HCN and HF in Solid Argon at 12 K," *J. Am. Chem. Soc.* **1983**, *105*, 163-168.
193. B. J. Kelsall and L. Andrews, "Absorption Spectra and Photochemical Rearrangements of Toluene, Cycloheptatriene, and Norbornadiene Cations to Methylene-Cyclohexadiene Cation in Solid Argon," *J. Am. Chem. Soc.* **1983**, *105*, 1413-1419.
194. B. J. Kelsall and L. Andrews, "FTIR Spectroscopic Studies of the Matrix Photoionization and Photolysis Products of Methylene Halides," *J. Mol. Spectrosc.* **1983**, *97*, 362-378.
195. M. Hawkins and L. Andrews, "Reactions of Atomic Oxygen with Ethene in Solid Argon. The Infrared Spectrum of Vinyl Alcohol," *J. Am. Chem. Soc.* **1983**, *105*, 2523-2530.
196. D. E. Pullin, B. J. Kelsall, and L. Andrews, "Matrix Photolysis of Diphenyl Species," *J. Mol. Struct.* **1983**, *98*, 213-220.

197. B. J. Kelsall, L. Andrews, and H. Schwarz, "Absorption Spectra and Photochemical Rearrangements of Chlorostyrene and Bromostyrene Cations in Solid Argon at 20 K," *J. Phys. Chem.* **1983**, *87*, 1295-1300.
198. B. J. Kelsall, L. Andrews, and G. J. McGarvey, "Absorption Spectra and Photochemical Rearrangements of Xylene and Methylcycloheptatriene Cations in Solid Argon," *J. Phys. Chem.* **87**, 1788-1795.
199. L. Andrews and G. L. Johnson, "FTIR Spectra of (HF)<sub>2</sub> and (HF)<sub>3</sub> Species in Solid Argon at 12 K," *Chem. Phys. Letts.* **1983**, *96*, 133-138.
200. G. L. Johnson and L. Andrews, "Infrared Spectra of Hydrogen-Bonded Complexes Between CH<sub>3</sub>CN and HF in Solid Argon," *J. Phys. Chem.* **1983**, *87*, 1852-1859.
201. S. M. Sonchik, L. Andrews and K. D. Carlson, "Matrix Reactions of Molecular Oxygen and Ozone with Aluminum Atoms," *J. Phys. Chem.* **1983**, *87*, 2004-2011.
202. L. Andrews, R. T. Arlinghaus, and C. K. Payne, "Absorption Spectra of Substituted Biphenyl Cations in Solid Argon and a Comparison with Photoelectron Spectra," *J. Chem. Soc., Faraday Trans.* **1983**, *2*, 79, 885-895.
203. L. Andrews, J. M. Dyke, N. Jonathan, N. Keddar, A. Morris, and A. Ridha, "The First Band in the He(I) Photoelectron Spectrum of the CH<sub>2</sub>Cl Free Radical," *Chem. Phys. Letts.* **1983**, *97*, 89-93.
204. L. Andrews "FTIR Spectra of Base-Hydrogen Fluoride Hydrogen Bonded Complexes in Solid Argon," *J. Mol. Struct.* **1983**, *100*, 281-303.
205. L. Andrews, R. T. Arlinghaus, and G. L. Johnson, "Infrared Spectra of Hydrogen-Bonded Complexes in Solid Argon," *J. Chem. Phys.* **1983**, *78*, 6347-6352.
206. L. Andrews, R. T. Arlinghaus, and G. L. Johnson, "Infrared Spectrum of the OC--HCl Complex in Solid Argon," *J. Chem. Phys.* **1983**, *78*, 6353-6357.
207. L. Andrews, "Infrared Absorption Spectra of Molecular Ions in Solid Argon," Proceedings of a NATO Advanced Study Institute on Molecular Ions, Plenum, New York, **1983**.
208. L. Andrews, "Visible and Ultraviolet Spectra and Photochemistry of Molecular Ions in Solid Argon," Proceedings of a NATO Advanced Study Institute on Molecular Ions, Plenum, New York, **1983**.
209. L. Andrews, "Spectroscopy of Molecular Ions in Noble Gas Matrices," Ch. 5 in *Molecular Ions: Spectroscopy, Structure and Chemistry*, edited by T. A. Miller and V. E. Bondybey, North-Holland Publishing Company, Amsterdam, **1983**.
210. L. Andrews, B. J. Kelsall, and R. T. Arlinghaus, "FTIR Observation of the N<sub>2</sub>--HF Complex in Solid Argon," *J. Chem. Phys.* **1983**, *79*, 2488-2490.

211. L. Andrews and G. L. Johnson, "FTIR Spectra of Water Hydrogen Fluoride Complexes in Solid Argon. Evidence for Inversion Doubling in the HF Librational Mode of  $\text{H}_2\text{O}\cdots\text{HF}$ ," *J. Chem. Phys.* **1983**, *79*, 3670-3677.
212. L. Andrews, "FTIR Spectra of Base-Hydrogen Fluoride Hydrogen-Bonded Complexes in Solid Argon," *J. Mol. Struct.* **1983**, *100*, 281-303.
213. B.J. Kelsall, L. Andrews, and C. Trindle, "Absorption Spectra and Photochemical Rearrangements of the 1,2-Benzotropilidene Molecule and Parent Cation in Solid Argon," *J. Phys. Chem.* **1983**, *87*, 4898-4903.
214. L. Andrews, B.J. Kelsall, J.H. Miller, and B.W. Keelan, "Absorption Spectrum of the Carbon Tetrachloride Molecular Cation in Noble-Gas Matrices," *J. Chem. Soc. Faraday Trans.* **1983**, *79*, 1417-1424.
215. L. Andrews, J. M. Dyke, N. Jonathan, N. Keddar, and A. Morris "A Spectroscopic Study of the Ground States of  $\text{CHCl}_2^+$  and  $\text{CDCl}_2^+$  Using a New Multichannel Detector Photoelectron Spectrometer," *J. Chem. Phys.* **1983**, *79*, 4650-4652.
216. L. Andrews, J. M. Dyke, N. Jonathan, N. Keddar, and A. Morris, "Photoelectron Spectroscopic Study of the Ground States of  $\text{CH}_2\text{Cl}^+$ ,  $\text{CHCl}_2^+$ , and  $\text{CHFCl}^+$ ," *J. Am. Chem. Soc.* **1984**, *106*, 299-303.
217. L. Andrews and G.L. Johnson, "Fourier-Transform Infrared Spectra of  $(\text{HF})_n$  Species in Solid Argon," *J. Phys. Chem.* **1984**, *88*, 425-432.
218. L. Andrews, J.M. Dyke, N. Jonathan, N. Keddar, and A. Morris, "The First Bands in the Photoelectron Spectra of the  $\text{CH}_2\text{Br}$ ,  $\text{CD}_2\text{Br}$ ,  $\text{CHBr}_2$ , and  $\text{CH}_2\text{I}$  Free Radicals," *J. Phys. Chem.* **1984**, *88*, 1950-1954.
219. L. Andrews, J.M. Dyke, N. Jonathan, N. Keddar, and A. Morris, "A Photoelectron Spectroscopic Study of the Ground States of  $\text{CH}_2\text{F}^+$  and  $\text{CD}_2\text{F}^+$ ," *J. Phys. Chem.* **1984**, *88*, 2364-2368.
220. R.S. Friedman, B.J. Kelsall, and L. Andrews, "Vibronic Absorption Spectra of Dichloro- and Dibromobenzene Cations in Solid Argon at 20 K," *J. Phys. Chem.* **1984**, *88*, 1944-1950.
221. M. Hawkins, L. Andrews, A.J. Downs, and D.J. Drury, "Photochemistry of an Ozone Molecular Complex with Iodine Monochloride in Cryogenic Matrices. The Infrared Spectra of Iodosyl Chloride ( $\text{OICl}$ ) and Iodyl Chloride ( $\text{O}_2\text{ICl}$ )" *J. Am. Chem. Soc.* **1984**, *106*, 3076-3082.
222. B.J. Kelsall and L. Andrews, "Photochemical Rearrangements of  $\text{C}_6\text{H}_8$ ,  $\text{C}_7\text{H}_{10}$ , and  $\text{C}_8\text{H}_{12}$  Radical Cations in Solid Argon at 20 K," *J. Phys. Chem.* **1984**, *88*, 2723-2729.
223. L. Andrews, "Fourier Transform Infrared Spectra of HF Complexes in Solid Argon," *J. Phys. Chem.* **1984**, *88*, 2940-2949.



224. R. T. Arlinghaus and L. Andrews, "Fourier-Transform Infrared Spectra of Alkyl Halide-HF Hydrogen-Bonded Complexes in Solid Argon," *J. Phys. Chem.* **1984**, *88*, 4032-4036.
225. L. Andrews, V.E. Bondybey, and J.H. English, "FTIR Spectra of (HF)<sub>n</sub> Species in Solid Neon," *J. Chem. Phys.* **1984**, *81*, 3452-3457.
226. R.T. Arlinghaus and L. Andrews, "Infrared Spectra of the PH<sub>3</sub>, AsH<sub>3</sub>, and SbH<sub>3</sub>--HX Hydrogen Bonded Complexes in Solid Argon," *J. Chem. Phys.* **1984**, *81*, 4341-4351.
227. B.J. Kelsall and L. Andrews, "Absorption Spectra of Diphenylacetylene and 1,4-Diphenylbutadiyne Cations in Solid Argon," *High Temp. Sci.* **1984**, *17*, 155-163.
228. S. M. Sonchik, L. Andrews and K.D. Carlson, "Matrix Reactions of Ozone with Gallium, Indium and Thallium Atoms," *J. Phys. Chem.* **1984**, *88*, 5269-5273.
229. L. Andrews and G.L. Johnson, "Fourier Transform Infrared Spectra of Simple Carbonyl-HF Complexes in Solid Argon," *J. Phys. Chem.* **1984**, *88*, 5887-5893.
230. B. J. Kelsall and L. Andrews, "Absorption Spectra and Photochemical Rearrangements of Alkyl- and Dialkylbenzene Cations in Solid Argon," *J. Phys. Chem.* **1984**, *88*, 5893-5898.
231. L. Manceron and L. Andrews, "Infrared Spectrum of the LiC<sub>2</sub>H<sub>2</sub> Molecule in Solid Argon," *J. Am. Chem. Soc.* **1985**, *107*, 563-568.
232. L. Andrews, B. J. Kelsall, I. R. Dunkin, and J. T. Lurito, "Absorption Spectra and Photochemical Rearrangements of C<sub>10</sub>H<sub>12</sub> Radical Cations in Solid Argon," *J. Phys. Chem.* **1985**, *89*, 821-827.
233. R. S. Friedman and L. Andrews, "Photochemical Rearrangements of o- and m-Dichlorobenzene Cations to p-Dichlorobenzene Cation in Solid Argon," *J. Am. Chem. Soc.* **1985**, *107*, 822-826.
234. I. R. Dunkin and L. Andrews, "Orbital Symmetry Conversion and Frontier Orbital Control in the Reactions of Organic Radical Cations," *Tetrahedron*, **1985**, *41*, 145-161.
235. I. R. Dunkin, L. Andrews, J. T. Lurito, and B. J. Kelsall, "Absorption Spectra and Photochemical Rearrangements of C<sub>8</sub>H<sub>10</sub> Cations in Solid Argon," *J. Phys. Chem.* **1985**, *89*, 1701-1705.
236. L. Andrews, G. L. Johnson, and S. R. Davis, "Infrared Spectrum of the Benzene-Hydrogen Fluoride Complex in Solid Argon," *J. Phys. Chem.* **1985**, *589*, 1706-1709.
237. L. Andrews, G. L. Johnson, and S. R. Davis, "FTIR Spectra of the Dimethyl Ether-Hydrogen Fluoride Complex and Related Complexes in Solid Argon," *J. Phys. Chem.* **1985**, 1710-1715.

238. R. Withnall and L. Andrews, "Infrared Spectroscopic Evidence for Silicon-Oxygen Double Bonds: Silanone and the Silanoic and Silicic Acid Molecules," *J. Am. Chem. Soc.* **1985**, *107*, 2567-2568.
239. R. D. Hunt and L. Andrews, "Photolysis of Hydrogen and Fluorine in Solid Argon. Matrix Infrared Spectra of (HF)<sub>2</sub>, (HF)(DF) and (DF)<sub>2</sub>," *J. Chem. Phys.* **1985**, *82*, 4442-4448.
240. R. T. Arlinghaus and L. Andrews, "Infrared Spectra of the H<sub>2</sub>S--HF and H<sub>2</sub>Se--HF Hydrogen-Bonded Complexes in Solid Argon," *Inorg. Chem.* **1985**, *24*, 1523-1527.
241. S. R. Davis and L. Andrews, "FTIR Spectra of the HF Complexes with Alkyl Cyanides in Solid Argon," *J. Mol. Spec.* **1985**, *89*, 219-234.
242. R. Withnall and L. Andrews, "Matrix Reactions of Silane and Oxygen Atoms. Infrared Spectroscopic Evidence for the Silanol, Silanone, and Silanoic and Silicic Acid Molecules," *J. Phys. Chem.* **1985**, *89*, 3261-3268.
243. J. T. Lurito and L. Andrews, "Vibronic Absorption Spectra of Fluorobenzene and Difluorobenzene Radical Cations in Solid Argon," *Chem. Phys.* **1985**, *97*, 121-125.
244. L. Andrews, R.S. Friedman and B.J. Kelsall, "Vibronic Absorption Spectra of Condensed Ring Aromatic Cation Systems in Solid Argon," *J. Phys. Chem.* **1985**, *89*, 4016-4020.
245. L. Manceron and L. Andrews, "Evidence of Alkali Metal Induced Intermolecular Acetylenic Hydrogen Atom Transfer between Hydrogen-Bonded Alkyne Complexes in Solid Argon," *J. Phys. Chem.* **1985**, *89*, 4094-4098.
246. K. O. Patten, Jr. and L. Andrews, "Fourier Transform Infrared Spectra of Conjugated Diene and Cumulene Complexes with HF in Solid Argon," *J. Am. Chem. Soc.* **1985**, *107*, 5594-5600.
247. L. Andrews and S.R. Davis, "FTIR Observation of N-N Stretching Fundamentals in Hydrogen-Bonded Complexes in Solid Argon," *J. Chem. Phys.* **1985**, *83*, 4983-4989.
248. L. Andrews, R. S. Friedman, and B. J. Kelsall, "Vibronic Absorption Spectra of Dimethylnaphthalene Cations in Solid Argon," *J. Phys. Chem.* **1985**, *89*, 4550-4553.
249. M. Hawkins and L. Andrews, "Photochemistry of an Ozone Complex with Iodomethane in Solid Argon at 17 K. Infrared Spectra of Iodosomethane (CH<sub>3</sub>IO) and the Hydrogen Bonded CH<sub>2</sub>O-HI Complex," *Inorg. Chem.* **1985**, *24*, 3285-3290.
250. J. T. Lurito, I. R. Dunkin, and L. Andrews, "Ultraviolet Spectra of all-trans-Octatetraene and -Decapentaene in Solid Argon," *J. Mol. Spec.* **1985**, *114*, 54-59.
251. L. Andrews, M. Hawkins, and R. Withnall, "Photochemistry of an Ozone Complex with Trifluoroiodomethane in Solid Argon," *Inorg. Chem.* **1985**, *24*, 4234-4239.

252. R. Withnall, M. Hawkins, and L. Andrews, "Infrared Spectrum of a Symmetrical Phosphine-Ozone Complex in Solid Argon," *J. Phys. Chem.* **1986**, *90*, 575-579.
253. K. O. Patten, Jr. and L. Andrews, "Base Deuteration Effects on HF Complexes in Solid Argon," *J. Chem. Phys.* **1986**, *84*, 2898-2899.
254. K. O. Patten, Jr. and L. Andrews, "Fourier-Transform Infrared Spectra of HF Complexes with Acetic Acid and Methyl Acetate in Solid Argon," *J. Phys. Chem.* **1986**, *90*, 1073-1076.
255. S. R. Davis and L. Andrews, "FTIR Spectra of Halobenzene Complexes with Hydrogen Fluoride in Solid Argon," *J. Phys. Chem.* **1986**, *90*, 2600-2608.
256. K. O. Patten, Jr. and L. Andrews, "Infrared Spectra of Diacetylene-Hydrogen Fluoride Complexes in Solid Argon," *J. Phys. Chem.* **1986**, *90*, 3910-3916.
257. L. Andrews, S. R. Davis, and G. L. Johnson, "FTIR Spectra of Methyl-Substituted Amine-Hydrogen Fluoride Complexes in Solid Argon and Nitrogen," *J. Phys. Chem.* **1986**, *90*, 4273-4282.
258. L. Manceron and L. Andrews, "Infrared Spectra and Structures of  $\text{Li}(\text{C}_2\text{H}_4)_n$  ( $n = 1,2,3$ ) and  $\text{Li}_2\text{C}_2\text{H}_4$  in Solid Argon," *J. Phys. Chem.* **1986**, *90*, 4514-4528.
259. L. Andrews, R. T. Arlinghaus, and R. D. Hunt, "FTIR Spectra of Dialkyl Sulfide and Alkanethiol Complexes with Hydrogen Fluoride in Solid Argon," *Inorg. Chem.* **1986**, *25*, 3205-3209.
260. L. Manceron, M. Hawkins, and L. Andrews, "Infrared Spectra of Ternary Lithium-Ethylene-Nitrogen Complexes in Solid Argon," *J. Phys. Chem.* **1986**, *90*, 4987-4993.
261. R. Withnall and L. Andrews, "Infrared Spectroscopic Evidence for Silicon-Oxygen Double Bonds: Methyl- and Dimethylsilanones in Solid Argon," *J. Am. Chem. Soc.* **1986**, *108*, 8118-8119.
262. L. Andrews and J. T. Lurito, "Absorption Spectra and Photochemical Rearrangement of Octatetraene and Decapentaene Radical Cations in Solid Argon," *Tetrahedron*, **1986**, *42*, 6343-6349.
263. S. Suzer and L. Andrews, "Infrared Spectra of Alkali Metal Atom-Ammonia Complexes in Solid Argon," *J. Am. Chem. Soc.* **1987**, *109*, 300-304.
264. L. Andrews and B. J. Kelsall, "Matrix Absorption Spectra of the Radicals Formed by the Addition of Hydrogen Atoms to Phenylacetylene," *J. Phys. Chem.* **1987**, *91*, 1435-1440.
265. R. Withnall and L. Andrews, "FTIR Spectra of the Photolysis Products of the Phosphine-Ozone Complex in Solid Argon," *J. Phys. Chem.* **1987**, *91*, 784-797.

266. S. R. Davis and L. Andrews, "FTIR Spectra of HF Complexes with Phenylalkynes in Solid Argon and Nitrogen," *J. Mol. Struct.* **1987**, *157*, 103-117.
267. R. D. Hunt and L. Andrews, "FTIR Spectra of Cyanamide Complexes with Hydrogen Fluoride in Solid Argon," *J. Phys. Chem.* **1987**, *91*, 2751-2755.
268. R. D. Hunt and L. Andrews, "Infrared Spectra of the Very Weak H<sub>2</sub>--HF and O<sub>2</sub>--HF Complexes in Solid Neon," *J. Chem. Phys.* **1987**, *86*, 3781-3786.
269. S. R. Davis and L. Andrews, "Infrared Spectra of HF Complexes with Methane, Silane, and Germane," *J. Chem. Phys.* **1987**, *86*, 3765-3772.
270. S. R. Davis, L. Andrews, and C. O. Trindle, "Infrared Spectra and UHF SCF Calculations of HF Complexes with NO, (NO)<sub>2</sub>, and NO<sub>2</sub>," *J. Chem. Phys.* **1987**, *86*, 6027-6033.
271. R. Lascola and L. Andrews, "FTIR Spectra of Hydroxylamine-Hydrogen Fluoride Complexes in Solid Argon," *J. Am. Chem. Soc.* **1987**, *109*, 4765-4768.
272. S. R. Davis and L. Andrews, "Infrared Spectra and ab Initio SCF Calculations for Alkane-Hydrogen Fluoride Complexes," *J. Am. Chem. Soc.* **1987**, *109*, 4768-4775.
273. S. Suzer and L. Andrews, "FTIR Spectra of Ammonia Clusters in Noble Gas Matrices," *J. Chem. Phys.* **1987**, *87*, 5131-5140.
274. R. D. Hunt and L. Andrews, "FTIR Spectra of Photolytic Reactions of HCN with F<sub>2</sub> in Solid Argon," *Inorg. Chem.* **1987**, *26*, 3051-3054.
275. L. Andrews and R. Lascola, "Infrared Spectra of the NH<sub>3</sub>--F<sub>2</sub> and NH<sub>2</sub>F--HF Complexes in Solid Argon," *J. Am. Chem. Soc.* **1987**, *109*, 6243-6247.
276. S. Suzer and L. Andrews, "IR Spectra of Complexes of Na, K and Cs with H<sub>2</sub>O in Solid Argon," *Chem. Phys. Letts.* **1987**, *140*, 300-305.
277. R. D. Hunt and L. Andrews, "Infrared Spectra of Cyanogen Halide Complexes with Hydrogen Fluoride in Solid Argon," *J. Phys. Chem.* **1987**, *91*, 5594-5598.
278. R.D. Hunt and L. Andrews, "FTIR Spectra of the HF<sub>2</sub><sup>-</sup> and H<sub>2</sub>F<sub>3</sub><sup>-</sup> Anions Isolated in Solid Argon and Neon," *J. Chem. Phys.* **1987**, *87*, 6819-6823.
279. L. Andrews, R. Withnall, and R.D. Hunt, "Infrared Spectra of the O<sub>3</sub>--HF and SO<sub>2</sub>--HF Complexes in Solid Argon," *J. Phys. Chem.* **1988**, *92*, 78-81.
280. L. Andrews, and R.D. Hunt, "Matrix Trapping of Two Structural Arrangements of Weak Complexes," *J. Phys. Chem.* **1988**, *92*, 81-85.
281. S. Suzer and L. Andrews, "Matrix Isolation Study of Electron Impact on H<sub>2</sub>O. Infrared Spectrum of OH<sup>-</sup> in Solid Argon," *J. Chem. Phys.* **1988**, *88*, 916-921.

282. R. Withnall and L. Andrews, "Matrix Reactions of Methylsilanes and Oxygen Atoms," *J. Phys. Chem.* **1988**, *92*, 594-602.
283. R. D. Hunt and L. Andrews, "Photochemical Reactions of ClF and BrF with Hydrogen in Solid Argon. Infrared Spectra of Mixed Hydracid Dimers," *J. Phys. Chem.* **1988**, *88*, 3599-3606.
284. R. Lascola, R. Withnall, and L. Andrews, "Infrared Spectra of Hydrazine and Products of Its Reactions with HF, F<sub>2</sub>, and O<sub>3</sub> in Solid Argon," *Inorg. Chem.* **1988**, *27*, 642-648.
285. R. Lascola, R. Withnall, and L. Andrews, "Infrared Spectra of HNF<sub>2</sub>, NF<sub>3</sub>, PF<sub>3</sub>, and PCl<sub>3</sub> and Complexes with HF in Solid Argon," *J. Phys. Chem.* **1988**, *92*, 2145-2149.
286. L. Manceron and L. Andrews, "Infrared Spectra and Structures of Lithium-Styrene and Lithium-Phenylacetylene Complexes in Solid Argon," *J. Phys. Chem.* **1988**, *92*, 2150-2155.
287. R. Withnall and L. Andrews, "Matrix Infrared Spectra and Normal-Coordinate Analysis of Isotopic Hydroxylamine Molecules," *J. Phys. Chem.* **1988**, *92*, 2155-2161.
288. G. A. Olah, et al., S. Suzer and L. Andrews, "Aluminum Dichloride and Dibromide," *J. Am. Chem. Soc.* **1988**, *110*, 3231-3238.
289. R.D. Hunt and L. Andrews, "Infrared Spectra of Diatomic Halogen Complexes with Hydrogen Fluoride in Solid Argon and Neon," *J. Phys. Chem.* **1988**, *92*, 3769-3744.
290. L. Manceron and L. Andrews, "Infrared Spectra and Structures of Lithium-Benzene and Lithium-Dibenzene Complexes in Solid Argon," *J. Am. Chem. Soc.* **1988**, *110*, 3840-3846.
291. L. Andrews and R. Withnall, "Matrix Reactions of Oxygen Atoms with P<sub>4</sub>. Infrared Spectra of P<sub>4</sub>O, P<sub>2</sub>O, PO and PO<sub>2</sub>," *J. Am. Chem. Soc.* **1988**, *110*, 5605-5611.
292. R. Withnall and L. Andrews, "Infrared Spectra of O-Atom-PH<sub>3</sub> Reaction Products Trapped in Solid Argon," *J. Phys. Chem.* **1988**, *92*, 4610-4619.
293. S. Suzer and L. Andrews, "Matrix Infrared Study of Low-Energy Electron and Alkali Cation Impact on CCl<sub>4</sub>," *Chem. Phys. Lett.* **1988**, *150*, 13-16.
294. S. Suzer and L. Andrews, "Matrix Infrared Study of NH<sub>2</sub><sup>-</sup> Produced by Electron Impact on NH<sub>3</sub>," *J. Chem. Phys.* **1988**, *89*, 5347-5349.
295. L. Andrews and R.D. Hunt, "Infrared Spectra of ClF, Cl<sub>2</sub>, and Cl complexes with HCl in Solid Argon," *J. Chem. Phys.* **1988**, *89*, 3502-3504.
296. S. Suzer and L. Andrews, "Optical Spectra of Yb Atoms and Dimers in Rare Gas Matrices," *J. Chem. Phys.* **1988**, *89*, 5514-5516.
297. L. Andrews, "Infrared Spectra of HF Complexes in Noble-Gas Solids," *Faraday Discuss. Chem. Soc.* **1988**, *86*, 37-44.

298. R. Withnall, M. McCluskey, and L. Andrews, "Absorption Spectra of the PO<sub>2</sub> and PO<sub>3</sub> Radicals in Solid Argon," *J. Phys. Chem.* **1989**, *93*, 126-129.
299. L. Andrews, B.W. Moores, and K. K. Fonda, "Matrix Infrared Spectra of Reaction and Photolysis Products of Stibine and Ozone," *Inorg. Chem.* **1989**, *28*, 290-297.
300. Z. Mielke, M. Hawkins, and L. Andrews, "Matrix Reactions of Oxygen Atoms with CH<sub>3</sub>CN. Infrared Spectra of HOCH<sub>2</sub>CN and CH<sub>3</sub>CNO," *J. Phys. Chem.* **1989**, *93*, 558-564.
301. S. R. Davis and L. Andrews, "Infrared Spectra and Ab Initio Calculations of Disilane and Methysilane Complexes with HF in Solid Argon," *J. Phys. Chem.* **1989**, *93*, 1273-1279.
302. L. Andrews and R. Withnall, "Cocondensation Reaction between Phosphine and Fluorine: Matrix Infrared Spectra of PH<sub>3</sub>F<sub>2</sub>, PHF<sub>2</sub>, and PH<sub>2</sub>F," *Inorg. Chem.* **1989**, *28*, 494-499.
303. L. Andrews, R. Withnall, and B.W. Moores, "Infrared Spectra of Arsine-Ozone Complexes, Reaction Products, and Photolysis Products in Solid Argon," *J. Phys. Chem.* **1989**, *93*, 1279-1285.
304. B. W. Moores and L. Andrews, "Oxidation of Phosphorus (III) Halides by Red Photolysis of Ozone Complexes in Solid Argon," *J. Phys. Chem.* **1989**, *93*, 1902-1907.
305. S. Suzer and L. Andrews, "Matrix Infrared Study of Low-Energy Electron Impact on Hydrocarbons," *J. Phys. Chem.* **1989**, *93*, 2123-2129.
306. L. Manceron and L. Andrews, "Infrared Spectrum of the AlC<sub>2</sub>H<sub>4</sub> Molecule in Solid Argon," *J. Phys. Chem.* **1989**, *93*, 2964-2970.
307. Z. Mielke and L. Andrews, "Infrared Spectra of P<sub>4</sub>O<sub>6</sub>, P<sub>4</sub>O<sub>7</sub>, P<sub>4</sub>O<sub>8</sub>, P<sub>4</sub>O<sub>9</sub>, and P<sub>4</sub>O<sub>10</sub> in Solid Argon," *J. Phys. Chem.* **1989**, *93*, 2971-2976.
308. L. Andrews, "The Liquid Phase of Carbon Dioxide: A Simple Lecture Demonstration," *J. Chem. Ed.* **1989**, *66*, 597-598.
309. L. Andrews and R.B. Bohn, "Infrared Spectra of Isotopic (HCl)<sub>3</sub> Clusters in Solid Neon," *J. Chem. Phys.* **1989**, *90*, 5205-5207.
310. R.B. Bohn and L. Andrews, "Matrix Infrared Spectra of the NH<sub>3</sub>--HCN and NH<sub>3</sub> (HCN)<sub>2</sub> Complexes in Solid Argon," *J. Phys. Chem.* **1989**, *93*, 3974-3979.
311. R.B. Bohn, R.D. Hunt and L. Andrews, "Infrared Spectra of the Weak H<sub>2</sub>, O<sub>2</sub>, and N<sub>2</sub> Complexes with HCl in Solid Argon," *J. Phys. Chem.* **1989**, *93*, 3979-3983.
312. L. Andrews, R. B. Bohn, R.T. Arlinghaus, and R. D. Hunt, "Matrix Infrared Spectra of HF Complexes with N<sub>2</sub>O, OCS and CS<sub>2</sub>," *Chem. Phys. Letts.* **1989**, *158*, 564-569.
313. J. Hacaloglu and L. Andrews, "A Chemical Ionization Source of Molecular Ions for Matrix-Isolation Spectroscopy," *Chem. Phys. Letts.* **1989**, *160*, 274-279.

314. R.B. Bohn and L. Andrews, "Infrared Spectra of Amide--HF Complexes in Solid Argon," *J. Phys. Chem.* **1989**, *93*, 5684-5692.
315. J. Hacaloglu and L. Andrews, "Chemical Ionization of Chloromethanes for Matrix Isolation Spectroscopy," *J. Mol. Struct.* **1989**, *200*, 325-338.
316. L. Andrews and Z. Mielke, "Infrared Spectra of As<sub>4</sub>-Ozone Reaction and Photolysis Products in Solid Argon," *Inorg. Chem.* **1989**, *28*, 4001-4006.
317. Z. Mielke, M. McCluskey, and L. Andrews, "Matrix Reactions of P<sub>2</sub> and O<sub>3</sub> Molecules," *Chem. Phys. Lett.* **1990**, *165*, 146-154.
318. L. Andrews, "Fourier Transform Infrared Spectroscopy of Matrix-Isolated Species," *Vibrational Spectra and Structure*, **1990**, *Ch. 4, Vol. 18*, J.R. Durig, Ed. Elsevier Science Publishers, Amsterdam.
319. J. Hacaloglu, S. Suzer, and L. Andrews, "Chemical Ionization Discharge of N<sub>2</sub>O for Matrix Infrared Spectroscopic Study of Isolated Anions," *J. Phys. Chem.* **1990**, *94*, 1759-1764.
320. R. Withnall and L. Andrews, "Matrix Reactions of Germane and Oxygen Atoms. Infrared Spectroscopic Evidence for Germylene-Water Complex, Germanone, Germanol, Hydroxygermylene, and Germanic Acid," *J. Phys. Chem.* **1990**, *94*, 2351-2357.
321. L. Andrews and Z. Mielke, "Vibronic Absorption Spectra of P<sub>4</sub><sup>+</sup> and P<sub>3</sub> in Solid Argon," *J. Phys. Chem.* **1990**, *94*, 2348-2350.
322. L. Manceron and L. Andrews, "Infrared Spectrum of InC<sub>2</sub>H<sub>4</sub> in Solid Argon. Normal-Coordinate Analysis, Evaluation of the Electrooptical Parameters, and Comparison with Other Metal-Ethylene Complexes," *J. Phys. Chem.* **1990**, *94*, 3513-3518.
323. C. Dykstra and L. Andrews, "Structures, Stabilities, and Intermolecular Vibrational Frequencies of Small Ammonia Complexes by Molecular Mechanics for Clusters Analysis," *J. Chem. Phys.* **1990**, *92*, 6043-6048.
324. Z. Mielke and L. Andrews, "Matrix Infrared Studies of the HCN + O<sub>3</sub> and HCN + O Systems," *J. Phys. Chem.* **1990**, *94*, 3519-3525.
325. Z. Mielke and L. Andrews, "Matrix Infrared Spectra of the Products from Photochemical Reactions of P<sub>4</sub> and O<sub>3</sub> and Decomposition of P<sub>4</sub>O<sub>6</sub>," *Inorg. Chem.* **1990**, *29*, 2773-2779.
326. L. Andrews, M. McCluskey, Z. Mielke, and R. Withnall, "Matrix Reactions of P<sub>4</sub> and P<sub>2</sub> With O<sub>3</sub> Molecules," *J. Mole. Struct.* **1990**, *222*, 95-108.
327. Z. Mielke, L. Andrews, K. A. Nguyen, and M. S. Gordon, "Matrix-Infrared Spectra of Structural Isomers of the Phosphorus Oxysulfide P<sub>4</sub>S<sub>3</sub>O," *Inorg. Chem.* **1990**, *29*, 5096-5100.

328. L. Andrews, G. G. Reynolds, Z. Mielke, and M. McCluskey, "Infrared Spectra of P<sub>4</sub>S<sub>10</sub> and Its Decomposition Products in Solid Argon," *Inorg. Chem.* **1990**, *29*, 5222-5225.
329. Z. Mielke, G. D. Brabson, and L. Andrews, "Matrix Infrared Spectra of the Phosphorus Sulfides PS, P<sub>2</sub>S, and PS<sub>2</sub>," *J. Phys. Chem.* **1991**, *95*, 75-79.
330. G. D. Brabson, Z. Mielke, and L. Andrews, "Infrared Spectra and Structures of Isotopically Enriched S<sub>3</sub> and S<sub>4</sub> in Solid Argon," *J. Phys. Chem.* **1991**, *95*, 79-86.
331. L. Andrews, "Infrared and Optical Absorption Spectroscopy of Molecular Ions in Solid Argon," pp. 55-72 in *Radical Ionic Systems*, A. Lund and M. Shiotani (eds.), Kluwer Academic Publishers, The Netherlands, **1991**.
332. R. D. Hunt, L. Andrews, and L. M. Toth, "Infrared Spectra of UF<sub>6</sub>, WF<sub>6</sub>, MoF<sub>6</sub>, and SF<sub>6</sub> Complexes with Hydrogen Fluoride in Solid Argon," *J. Phys. Chem.* **1991**, *95*, 1183-1188.
333. L. Andrews, B. S. Ault, M. J. Berry, and C. B. Moore, "Biography of George C. Pimentel," *J. Phys. Chem.*, **1991**, *95*, 2607-2608.
334. J.-P. Perchard, R. B. Bohn, and L. Andrews, "Matrix Infrared and Raman Spectra of the Inequivalent Submolecules in the Ammonia Dimer," *J. Phys. Chem.* **1991**, *95*, 2707-2712.
335. M. McCluskey, and L. Andrews, "Infrared Spectra of Products Formed by Photoinduced Reactions of (P<sub>2</sub>)<sub>x</sub>(O<sub>2</sub>)<sub>y</sub> Clusters," *J. Phys. Chem.* **1991**, *95*, 2679-2687.
336. M. McCluskey, and L. Andrews, "Matrix Infrared Spectra of the Products of the P<sub>2</sub> and O<sub>3</sub> Reaction," *J. Phys. Chem.* **1991**, *95*, 2988-2994.
337. M. McCluskey, and L. Andrews, "Matrix Infrared Study of the Nd:YAG Laser Depolymerization Products of Solid P<sub>4</sub>O<sub>10</sub>," *J. Phys. Chem.* **1991**, *95*, 3545-3549.
338. L. Andrews, and T. C. McInnis, "Matrix Reaction of Arsine and Fluorine: Infrared Spectrum of AsH<sub>2</sub>F," *Inorg. Chem.* **1991**, *30*, 2990-2993.
339. R. D. Hunt, L. Andrews, and T. M. Toth, "Matrix Infrared Spectra of HCl Complexes with UF<sub>6</sub>, WF<sub>6</sub>, and MoF<sub>6</sub>," *Inorg. Chem.* **1991**, *30*, 3829-3832.
340. Z. Mielke and L. Andrews, "Infrared Detection of the PCO Radical and HPCO Molecule," *Chem. Phys. Letts.* **1991**, *181*, 355-360.
341. L. Andrews and T. R. Burkholder, "Infrared Spectra of Boron Atom-Water Molecule Reaction Products Trapped in Solid Argon," *J. Phys. Chem.* **1991**, *95*, 8554-8560.
342. R. B. Bohn and L. Andrews, "FTIR Spectra of NH<sub>3</sub>-Methylamine Complexes in Solid Argon," *J. Phys. Chem.* **1991**, *95*, 9707-9712.
343. T. R. Burkholder and L. Andrews, "Reactions of Boron Atoms with Molecular Oxygen," *J. Chem. Phys.* **1991**, *95*, 8697-8709.



344. P. Hassanzadeh and L. Andrews, "Matrix Reactions of Sulfur Atoms and Fluorine. Infrared Spectra of SF, SF<sub>2</sub> and SF<sub>3</sub> in Solid Argon," *J. Phys. Chem.* **1992**, *96*, 79-84.
345. P. Hassanzadeh and L. Andrews, "Infrared Spectra of New Sulfur-Nitrogen Species in Solid Argon," *J. Am. Chem. Soc.* **1992**, *114*, 83-91.
346. Z. Gasyna, L. Andrews, and P. N. Schatz, "Near Infrared Absorption Spectra of C<sub>60</sub> Radical Cations and Anions Prepared Simultaneously in Solid Argon," *J. Phys. Chem.* **1992**, *96*, 1525-1528.
347. R. B. Bohn, G. D. Brabson, and L. Andrews, "Reactions of Atomic Hydrogen and Carbon Disulfide. Infrared Spectra of HSCS and HSHCS in Solid Argon," *J. Phys. Chem.* **1992**, *96*, 1582-1589.
348. T. C. McInnis and L. Andrews, "Photochemistry of H<sub>2</sub>O--F<sub>2</sub> Complexes in Solid Argon," *J. Phys. Chem.* **1992**, *96*, 2051-2059.
349. L. Andrews, T. C. McInnis, and Y. Hannachi, "Photochemistry of Hydrogen Sulfide - Fluorine Complexes in Solid Argon," *J. Phys. Chem.* **1992**, *96*, 4248-4254.
350. T. C. McInnis and L. Andrews, "Matrix Reactions of SiH<sub>4</sub> and GeH<sub>4</sub> with F<sub>2</sub>," *J. Phys. Chem.* **1992**, *96*, 5276-5284.
351. L. Andrews and M. McCluskey, "Bending Modes of SiO<sub>2</sub> and GeO<sub>2</sub> in Solid Argon," *J. Mol. Spect.* **1992**, *154*, 223-225.
352. R. B. Bohn, Y. Hannachi, and L. Andrews, "Production and Reactions of Triplet CS: Matrix Infrared and Ultraviolet Spectra of C<sub>2</sub>S<sub>2</sub>," *J. Am. Chem. Soc.* **1992**, *114*, 6452-6459.
353. P. Hassanzadeh and L. Andrews, "Infrared Spectra of GeS, SGeS, SGeO and OGeO in Solid Argon," *J. Phys. Chem.* **1992**, *96*, 6181-6185.
354. P. Hassanzadeh, and L. Andrews, "Vibronic Absorption Spectra of S<sub>3</sub> and S<sub>4</sub> in Solid Argon," *J. Phys. Chem.* **1992**, *96*, 6579-6585.
355. L. Andrews, S. R. Davis, and R. D. Hunt, "Far Infrared Spectra of (HF)<sub>2</sub> and (HF)<sub>3</sub> in Solid Argon," *Molecular Physics* **1992**, *77*, 993-1003.
356. L. Andrews and T. R. Burkholder, "Infrared Spectra of Molecular B(OH)<sub>3</sub> and HOBO in Solid Argon," *J. Chem. Phys.* **1992**, *97*, 7203-7210.
357. R. D. Hunt and L. Andrews, "Infrared Spectra of HF Complexes with CCl<sub>4</sub>, CHCl<sub>3</sub>, and CH<sub>2</sub>Cl<sub>2</sub> in Solid Argon," *J. Phys. Chem.* **1992**, *96*, 6945-6949.
358. L. Andrews, C. Thompson, and M. C. Démarcq, "Infrared Spectra of P<sub>4</sub>S<sub>10</sub>, P<sub>4</sub>S<sub>9</sub>, and P<sub>4</sub>S<sub>7</sub> in Solid Argon," *Inorg. Chem.* **1992**, *31*, 3173-3175.

359. P. Hassanzadeh, C. Thompson, and L. Andrews, "Absorption Spectra of Tellurium Clusters in Solid Argon," *J. Phys. Chem.* **1992**, *96*, 8246-8249.
360. G. D. Brabson and L. Andrews, "Infrared and Visible Spectra of Small Selenium Clusters ( $n = 2, 3, 4$ ) in Solid Argon," *J. Phys. Chem.* **1992**, *96*, 9172-9177.
361. P. Hassanzadeh and L. Andrews, "Pulsed Laser Assisted Reactions of B and N Atoms in a Condensing Nitrogen Stream," *J. Phys. Chem.* **1992**, *96*, 9177-9182.
362. L. Andrews, T. R. Burkholder, and J. T. Yustein, "Reactions of Pulsed-Laser Evaporated Aluminum Atoms with Oxygen. Infrared Spectra of the Reaction Products in Solid Argon," *J. Phys. Chem.* **1992**, *96*, 10182-10189.
363. T. R. Burkholder, J. T. Yustein, and L. Andrews, "Reactions of Pulsed Laser Evaporated Ga and In Atoms with Molecular Oxygen. Matrix Infrared Spectra of New  $\text{GaO}_2$  and  $\text{InO}_2$  Species," *J. Phys. Chem.* **1992**, *96*, 10189-10195.
364. T. R. Burkholder and L. Andrews, "Reaction of Boron Atoms with CO. Matrix Infrared Spectra of  $\text{BCO}$ ,  $(\text{BCO})_2$ , and  $\text{B}(\text{CO})_2$ ," *J. Phys. Chem.* **1992**, *96*, 10195-10201.
365. P. Hassanzadeh and L. Andrews, "Reactions of Pulsed Laser Evaporated Boron Atoms with Methane. 1. Synthesis and Characterization of a Novel Molecule with Carbon-Boron Double Bonds:  $\text{HBCBH}$ ," *J. Am. Chem. Soc.* **1992**, *114*, 9239-9240.
366. C. Xu, A. M. Le Quere, T. Burkholder, L. Manceron, and L. Andrews, "Reactions of Group III Atoms with Ethylene and Carbon Dioxide Molecules: A Matrix Isolation Study" in *Gas-Phase Metal Reactions*, A. Fontijn, Ed., North-Holland, Amsterdam, **1992**.
367. L. Andrews, P. Hassanzadeh, T. R. Burkholder, and J. M. L. Martin, "Reactions of Pulsed Laser Produced Boron and Nitrogen Atoms in a Condensing Argon Stream," *J. Chem. Phys.* **1993**, *98*, 922-931.
368. L. Andrews and J. T. Yustein, "Reaction of Pulsed Laser Evaporated Magnesium Atoms with Oxygen. Infrared Spectra of Linear  $\text{OMgO}$  and  $\text{MgOMgO}$  in Solid Argon," *J. Phys. Chem.* **1993**, *97*, 12700-12704.
369. R. D. Hunt and L. Andrews, "Reactions of Pulsed-Laser Evaporated Uranium Atoms with Molecular Oxygen: Infrared Spectra of  $\text{UO}$ ,  $\text{UO}_2$ ,  $\text{UO}_3$ ,  $\text{UO}_2^+$ , and  $\text{UO}_3\text{-O}_2$  in Solid Argon," *J. Chem. Phys.* **1993**, *98*, 3690-3696.
370. R. D. Hunt, J. T. Yustein and L. Andrews, "Matrix Infrared Spectra of  $\text{NUN}$  Formed by the Insertion of Uranium Atoms into Molecular Nitrogen," *J. Chem. Phys.* **1993**, *98*, 6070-6074.
371. R. D. Hunt, L. Andrews, and L. M. Toth, "Matrix Infrared Study on the Fluorination and Chlorination of  $\text{UCl}_4$ ," *Radiochimica Acta* **1993**, *60*, 17-20.
372. T. R. Burkholder and L. Andrews, "Matrix Infrared Spectra of Aluminum, Gallium, and Indium Complexes with Acetylene," *Inorg. Chem.* **1993**, *32*, 2491-2496.

373. Z. Mielke and L. Andrews, "Infrared Spectra of HSPH<sub>2</sub>, HPS<sub>2</sub>, HSPS<sub>2</sub> in Solid Argon," *J. Phys. Chem.* **1993**, *97*, 4313-4319.
374. P. Hassanzadeh and L. Andrews, "Reaction of Halogens with Laser-Ablated Boron. Infrared Spectra of BX<sub>n</sub> (X = F, Cl, Br, I; n = 1, 2, 3) in Solid Argon," *J. Phys. Chem.* **1993**, *97*, 4910-4915.
375. J. M. L. Martin, P. R. Taylor, J. T. Yustein, T. R. Burkholder, and L. Andrews, "Pulsed Laser Evaporation of Boron/Carbon Pellets: Infrared Spectra and Quantum Chemical Structures and Frequencies for BC<sub>2</sub>," *J. Chem. Phys.* **1993**, *99*, 12-16.
376. T. R. Burkholder, L. Andrews, and R. J. Bartlett, "Reaction of Boron Atoms with Carbon Dioxide. Matrix and ab Initio Calculated Infrared Spectra of OBCO," *J. Phys. Chem.* **1993**, *97*, 3500-3503.
377. L. Andrews, P. Hassanzadeh, J. M. L. Martin, and P. R. Taylor, "Pulsed Laser Evaporated Boron Atom Reactions with Acetylene. Infrared Spectra and Quantum Chemical Structure and Frequency Calculations for Several Novel BC<sub>2</sub>H<sub>2</sub> and HBC<sub>2</sub> Molecules," *J. Phys. Chem.* **1993**, *97*, 5839-5847.
378. P. Hassanzadeh, Y. Hannachi, and L. Andrews, "Pulsed Laser Evaporated Boron Atom Reactions with Methane. 2. Infrared Spectra of H<sub>2</sub>CBH<sub>2</sub>, H<sub>2</sub>CBH, HCBH, and HBCBH in Solid Argon," *J. Phys. Chem.* **1993**, *97*, 6418-6424.
379. P. Hassanzadeh, L. Andrews, and R. D. Davy, "Laser Ablated Boron Atom Reaction with Carbon Disulfide. Infrared Spectrum of SBCS in Solid Argon and Ab Initio Geometry and Frequency Calculations for Possible Products," *J. Phys. Chem.* **1993**, *97*, 7412-7416.
380. G. V. Chertihin and L. Andrews, "Reactions of Pulsed-Laser Ablated Al Atoms with H<sub>2</sub>. Infrared Spectra of AlH, AlH<sub>2</sub>, AlH<sub>3</sub> and Al<sub>2</sub>H<sub>2</sub> Species," *J. Phys. Chem.* **1993**, *97*, 10295-10300.
381. T. J. Tague, Jr., L. Andrews, and R. D. Hunt, "Matrix Infrared Spectra of the Products of Uranium-Atom Reactions with Carbon Monoxide and Carbon Dioxide," *J. Phys. Chem.* **1993**, *97*, 10920-10924.
382. T. J. Tague, Jr. and L. Andrews, "Reactions of Beryllium Atoms with Hydrogen. Matrix Infrared Spectra of Novel Product Molecules," *J. Am. Chem. Soc.* **1993**, *115*, 12111-12116.
383. D. V. McGrath, G. D. Brabson, K. B. Sharpless, and L. Andrews, "Investigation of Infrared Spectra of Oxoosmium (VI) Esters by Isotopic Labelling," *Inorg. Chem.*, **1993**, *32*, 4146-4165.
384. G. V. Chertihin, L. Andrews, and P. R. Taylor, "Reactions of Pulsed-Laser Evaporated Al with C and C<sub>2</sub>H<sub>2</sub>. Infrared Spectra and CASSCF Calculations for AlC, Al<sub>2</sub>C, Al<sub>2</sub>C<sub>2</sub> and AlC<sub>2</sub>H," *J. Am. Chem. Soc.* **1994**, *116*, 3513-3518.

385. C. A. Thompson and L. Andrews, "Noble Gas Complexes with BeO: Infrared Spectra of NG-BeO (NG = Ar, Kr, Xe)," *J. Am. Chem. Soc.* **1994**, *116*, 423-424.
386. C. A. Thompson and L. Andrews, "Reactions of Laser Ablated Be Atoms with O<sub>2</sub>: Infrared Spectra of Beryllium Oxides in Solid Argon," *J. Chem. Phys.* **1994**, *100*, 8689-8699.
387. T. J. Tague, Jr. and L. Andrews, "Reactions of Pulsed-Laser Evaporated Boron Atoms with Hydrogen. Infrared Spectra of Boron Hydride Intermediate Species in Solid Argon," *J. Am. Chem. Soc.* **1994**, *116*, 4970-4976.
388. G. V. Chertihin and L. Andrews, "Infrared Spectra of Reaction Products of Laser-Ablated Titanium and Titanium Dioxide with Nitrogen and Nitrous Oxide in Solid Argon," *J. Phys. Chem.* **1994**, *98*, 5891-5895.
389. L. Andrews, J. T. Yustein, C. A. Thompson, and R. D. Hunt, "Reactions of Pulsed-Laser Evaporated Ca, Sr, and Ba Atoms with O<sub>2</sub>. Infrared Spectra of the Metal Oxides, Oxide Dimers, Dioxides, and Peroxides in Solid Argon," *J. Phys. Chem.* **1994**, *98*, 6514-6521.
390. L. Andrews and P. Hassanzadeh, "Infrared Spectra of Binary Selenium-Nitrogen Species formed by Condensation of Microwave Discharge Products," *J. Chem. Soc. Chem Commun.* **1994**, 1523-1524.
391. Y. Hannachi, P. Hassanzadeh, and L. Andrews, "Ab Initio Study of the Insertion Product of the Boron-Methane Reaction: CH<sub>3</sub>BH," *J. Phys. Chem.* **1994**, *98*, 6950-6954.
392. L. Andrews and T. J. Tague, Jr., "Reactions of Pulsed-Laser Evaporated Be Atoms with CO<sub>2</sub>. Infrared Spectra of OCBEO and COBeO in Solid Argon," *J. Am. Chem. Soc.* **1994**, *116*, 6856-6859.
393. R. D. Hunt, C. A. Thompson, P. Hassanzadeh, and L. Andrews, "Infrared Spectra of the Products of F<sub>2</sub>, ClF and Cl<sub>2</sub> Reactions with Pulsed-Laser Evaporated Uranium Atoms in Solid Argon," *Inorg. Chem.*, **1994**, *33*, 388-391.
394. G. V. Chertihin and L. Andrews, "Reactions of Laser Ablated Ti Atoms with Hydrogen during Condensation in Excess Argon. Infrared Spectra of the TiH, TiH<sub>2</sub>, TiH<sub>3</sub>, and TiH<sub>4</sub> Molecules," *J. Am. Chem. Soc.* **1994**, *116*, 8322-8327.
395. T. J. Tague, Jr. and L. Andrews, "Pulsed Laser Evaporated Magnesium Atom Reactions with Hydrogen: Infrared Spectra of Five Magnesium Hydride Molecules," *J. Phys. Chem.* **1994**, *98*, 8611-8616.
396. L. Andrews, Z. Mielke, P. R. Taylor, and J. M. L. Martin, "Matrix Infrared Spectrum and ab Initio Calculations on the PNP Radical," *J. Phys. Chem.* **1994**, *98*, 10706-10709.
397. P. F. Souter, L. Andrews, A. J. Downs, T. M. Greene, B. Ma, and H. F. Schaefer, III, "Observed and Calculated Raman Spectra of the Ga<sub>2</sub>H<sub>6</sub> and Ga<sub>2</sub>D<sub>6</sub> Molecules," *J. Phys. Chem.* **1994**, *98*, 12824-12827.

398. L. Andrews, W. Saffell, and J. T. Yustein, "Reactions of Pulsed-Laser Evaporated Lithium Atoms with O<sub>2</sub> and N<sub>2</sub>O," *Chem. Phys.* **1994**, *189*, 343-349.
399. C. Samet, J. L. Rose, S. B. Piepho, J. Laurito, L. Andrews, and P. N. Schatz, "Analysis of the Jahn-Teller Effect in Matrix Isolated Cyclooctatetraene Mononegative Ion Using Magnetic Circular Dichroism Spectroscopy," *J. Am. Chem. Soc.* **1994**, *116*, 11109-11119.
400. G. V. Chertihin and L. Andrews, "Infrared Spectra of the Reaction Products of Laser-Ablated Titanium Atoms and Oxides with Carbon Monoxide in Solid Argon," *J. Am. Chem. Soc.* **1995**, *117*, 1595-1602.
401. C. A. Thompson, L. Andrews and R. D. Davy, "Reactions of Beryllium Species with N<sub>2</sub>: Infrared Spectra and Quantum Chemical Calculations of Beryllium Dinitrogen Complexes in Solid Argon and Nitrogen," *J. Phys. Chem.* **1995**, *99*, 7913-7924.
402. T. M. Green, W. Brown, L. Andrews, A. J. Downs, G. V. Chertihin, N. Runeberg, and P. Pyykko, "Matrix Infrared Spectroscopic and ab Initio Studies of ZnH<sub>2</sub>, CdH<sub>2</sub> and Related Metal Hydride Species," *J. Phys. Chem.* **1995**, *99*, 7925-7934.
403. L. Andrews, T. J. Tague, Jr., G. P. Kushto, and R. D. Davy, "Infrared Spectra of Beryllium Carbonyls from Reactions of Beryllium Atoms with Carbon Monoxide in Solid Argon," *Inorg. Chem.* **1995**, *34*, 2952-2961.
404. G. V. Chertihin and L. Andrews, "Reactions of Laser Ablated Titanium, Zirconium and Hafnium Atoms with Oxygen Molecules in Condensing Argon," *J. Phys. Chem.* **1995**, *99*, 6356-6366.
405. L. Manceron and L. Andrews, "Lithium Atom Matrix Reactions with Small Molecules," pp. 89-123 in *Lithium Chemistry: A Theoretical and Experimental Overview*, A.-M. Sapse and P. von Ragué Schleyer, Eds., John Wiley & Sons, Inc., **1995**.
406. G. V. Chertihin, L. Andrews, "Infrared Spectra of ZrH<sub>4</sub> and HfH<sub>4</sub> in Solid Argon," *J. Am. Chem. Soc.* **1995**, *117*, 6402-6403.
407. T. M. Green, L. Andrews, A. M. Downs, "Reactions of Zinc, Cadmium and Mercury Atoms with Methane," *J. Am. Chem. Soc.* **1995**, *117*, 8180-8187.
408. G. V. Chertihin, L. Andrews, "Infrared Spectra of FeH, FeH<sub>2</sub>, and FeH<sub>3</sub> in Solid Argon," *J. Phys. Chem.* **1995**, *99*, 12131-12134.
409. G. V. Chertihin, L. Andrews, "Reactions of Laser-Ablated Zr and Hf Atoms with Hydrogen. Matrix Infrared Spectra of the MH, MH<sub>2</sub>, and MH<sub>4</sub> Molecules," *J. Phys. Chem.* **1995**, *99*, 15004-15010.
410. C. A. Thompson and L. Andrews, "Reactions of B Atoms with NH<sub>3</sub> to Produce HBNH, BNBH, and B<sub>2</sub>N," *J. Am. Chem. Soc.* **1995**, *117*, 10125-10126.

411. C. A. Thompson, L. Andrews, J. M. L. Martin, and J. El-Yazal, "Infrared Spectra of Boron Atom-Ammonia Reaction Products in Solid Argon," *J. Phys. Chem.* **1995**, *99*, 13839-13849.
412. L. Andrews, G. V. Chertihin, A. Ricca, and C. W. Bauschlicher, Jr., "Reactions of Laser-Ablated Iron Atoms with Oxygen Molecules: Matrix Infrared Spectra and Density Functional Calculations of OFeO, FeOO, and Fe(O<sub>2</sub>)," *J. Am. Chem. Soc.* **1996**, *118*, 467-470.
413. J. M. Dyke, D. Haggerston, O. Warschkow, L. Andrews, A. J. Downs, and P. F. Souter, "UV Photoelectron Spectra of the m-Hydrido Bridge-Bonded Molecules B<sub>2</sub>H<sub>6</sub>, GaBH<sub>6</sub> and Ga<sub>2</sub>H<sub>6</sub>," *J. Phys. Chem.* **1996**, *100*, 2998-3004.
414. G. V. Chertihin, W. Saffel, J. T. Yustein, L. Andrews, M. Neurock, A. Ricca, and C. W. Bauschlicher, Jr. "Reactions of Laser Ablated Iron Atoms with Oxygen Molecules in Condensing Argon. Infrared Spectra and Density Function Calculations of Iron Oxide Product Molecules." *J. Phys. Chem.* **1996**, *100*, 5261-5273.
415. P. Hassanzadeh, A. Citra, L. Andrews and M. Neurock, "Laser-Evaporated Aluminum Atom Reactions with Halogen Molecules," *J. Phys. Chem.* **1996**, *100*, 7317-7325.
416. L. Andrews, P. Hassanzadeh, G. D. Brabson, A. Citra, and M. Neurock, "Reactions of Nitric Oxide with Sulfur Species," *J. Phys. Chem.* **1996**, *100*, 8273-8279.
417. G. D. Brabson, A. Citra, L. Andrews, R. D. Davy, and M. Neurock, "Formation, Spectroscopy, Photochemistry, and Quantum Chemistry of the (S<sub>2</sub>)(O<sub>2</sub>) Complex in Solid Argon," *J. Am. Chem. Soc.* **1996**, *118*, 5469-5473.
418. G. D. Brabson, J. C. Dillon, and L. Andrews, "Infrared Spectrum of SeF in Solid Argon," *Chem. Phys. Letts.* **1996**, *254*, 94-97.
419. L. Andrews, G. V. Chertihin, C. A. Thompson, J. Dillon, S. Byrne, and C. W. Bauschlicher, Jr., "Infrared Spectra and Quantum Chemical Calculations of Group 2 MO<sub>2</sub>, O<sub>2</sub>MO<sub>2</sub> and Related Molecules," *J. Phys. Chem.* **1996**, *100*, 10088-10099.
420. G. V. Chertihin and L. Andrews, Infrared Spectra of the Reaction Products of Laser Ablated Lead Atoms and Oxygen Molecules in Condensing Argon and Nitrogen," *J. Chem. Phys.* **1996**, *105*, 2561-2574.
421. Y. K. Lee, Y. Hannachi, C. Xu, L. Andrews, and L. Manceron, "Infrared Spectrum of Nickel-Monoethylene. An Infrared Argon Matrix and Normal Coordinate Analysis Study," *J. Phys. Chem.* **1996**, *100*, 11228-11234.
422. L. Andrews, G. V. Chertihin, A. Citra, and M. Neurock, "Reactions of Laser-Ablated Iron Atoms with N<sub>2</sub>O, NO, and O<sub>2</sub> in Condensing Nitrogen. Infrared Spectra and Density Functional Calculations of Ternary Iron Nitride Oxide Molecules," *J. Phys. Chem.* **1996**, *100*, 11235-11241.

423. C. A. Thompson and L. Andrews, "Reactions of Laser Ablated Be Atoms with H<sub>2</sub>O: Infrared Spectra and Density Functional Calculations of HOBeOH, HBeOH and HBeOBeH," *J. Phys. Chem.* **1996**, *100*, 12214-12221.
424. G. V. Chertihin, L. Andrews, and M. Neurock, "Reactions of Laser Ablated Iron Atoms with Nitrogen Atoms and Molecules. Matrix Infrared Spectra and Density Functional Calculations of Novel Iron Nitride Molecules," *J. Phys. Chem.* **1996**, *100*, 14609-14617.
425. G. D. Brabson, L. Andrews, C. J. Marsden, "Reactions of Selenium and Oxygen. Matrix Infrared Spectra and Density Functional Calculations of Novel Se<sub>x</sub>O<sub>y</sub> Molecules," *J. Phys. Chem.* **1996**, *100*, 16487-16494.
426. P. F. Souter, G. P. Kushto, and L. Andrews, "IR Spectra of Uranium Hydride Molecules Isolated in Solid Argon," *Chem. Commun.* **1996**, 2401-2402.
427. L. Andrews, P. Hassanzadeh, D. V. Lanzisera, and G. D. Brabson, "Reactions of Selenium in a Quartz Discharge Tube. Infrared Spectra and Density Functional Theory Calculations of New Selenium-Nitrogen and Selenium-Silicon Species in Solid Argon," *J. Phys. Chem.* **1996**, *100*, 16667-16673.
428. C. A. Thompson and L. Andrews, "Reactions of Laser-Ablated Be and Mg Atoms with C<sub>2</sub>H<sub>2</sub>: Infrared Spectra and Density Functional Calculations of Novel Metal - Acetylene Species," *J. Am. Chem. Soc.* **1996**, *118*, 10242-10249.
429. Y. Hannachi, P. Hassanzadeh, and L. Andrews, "Reactions of Boron Atoms with Ethylene," *Chem. Phys. Letts.* **1996**, *250*, 421-427.
430. P. F. Souter and L. Andrews, "Activation of CO<sub>2</sub> by Laser-Ablated Group 6 Metal Atoms," *Chem. Commun.* **1997**, 777-778.
431. P. F. Souter, G. P. Kushto, L. Andrews, and M. Neurock, "Experimental and Theoretical Evidence for the Formation of Several Uranium Hydride Molecules," *J. Am. Chem. Soc.* **1997**, *119*, 1682-1687.
432. D. V. Lanzisera and L. Andrews, "Reactions of Laser-Ablated Beryllium Atoms with Hydrogen Cyanide in Excess Argon. FTIR Spectra and Quantum Chemical Calculations on BeCN, BeNC, HBeCN, and HBeNC," *J. Am. Chem. Soc.* **1997**, *119*, 6392-6398.
433. P. F. Souter and L. Andrews, "A Spectroscopic and Theoretical Study of the Reactions of Group 6 Metal Atoms with Carbon Dioxide," *J. Am. Chem. Soc.* **1997**, *119*, 7350-7360.
434. P. F. Souter and L. Andrews, "Infrared Spectra of Some Uranium Oxyfluoride Molecules Isolated in Solid Argon," *J. Mol. Struct.* **1997**, *412*, 161-167.
435. D. V. Lanzisera and L. Andrews, "Reactions of Laser-Ablated Boron Atoms with Methylamines. Matrix Infrared Spectra and MP2 Frequency Calculations for Isotopic Product Molecules," *J. Phys. Chem. A* **1997**, *101*, 824-830.

436. P. F. Souter, G. P. Kushto, L. Andrews, and M. Neurock, "Experimental and Theoretical Evidence for the Isolation of Thorium Hydride Molecules in Argon Matrices," *J. Phys. Chem. A* **1997**, *101*, 1287-1291.
437. D. V. Lanzisera and L. Andrews, "Reactions of Laser-Ablated Boron Atoms with Methanol. Infrared Spectra and *ab Initio* Calculations of CH<sub>3</sub>BO, CH<sub>2</sub>BOH, and CH<sub>2</sub>BO in Solid Argon," *J. Phys. Chem. A* **1997**, *101*, 1482-1487.
438. A. Citra, G. V. Chertihin, L. Andrews, and M. Neurock, "Reactions of Laser-Ablated Nickel Atoms with Dioxygen. Infrared Spectra and Density Functional Calculations of Nickel Oxides NiO, ONiO, Ni<sub>2</sub>O<sub>2</sub>, and Ni<sub>2</sub>O<sub>3</sub>, Superoxide NiOO, Peroxide Ni(O<sub>2</sub>), and Higher Complexes in Solid Argon," *J. Phys. Chem. A* **1997**, *101*, 3109-3118.
439. G. V. Chertihin, L. Andrews, and C. W. Bauschlicher, Jr., "Reactions of Laser-Ablated Copper Atoms with Dioxygen. Infrared Spectra of the Copper Oxides CuO, OCuO, CuOCuO, and OCuOCuO and Superoxide CuOO in Solid Argon," *J. Phys. Chem. A* **1997**, *101*, 4026-4034.
440. D. V. Lanzisera and L. Andrews, "Reactions of Laser-Ablated Aluminum Atoms with Ammonia. Infrared Spectra of HAlNH<sub>2</sub>, AlNH<sub>2</sub>, and HAlNH in Solid Argon," *J. Phys. Chem. A* **1997**, *101*, 5082-5089.
441. G. V. Chertihin, W. D. Bare, and L. Andrews, "Reactions of Laser-Ablated Vanadium Atoms with Dioxygen. Infrared Spectra of VO, VO<sub>2</sub>, OVOO<sub>2</sub>, and V<sub>2</sub>O<sub>2</sub> in Solid Argon," *J. Phys. Chem. A* **1997**, *101*, 5090-5096.
442. G. P. Kushto, P. F. Souter, L. Andrews, and M. Neurock, "A Matrix Isolation FT-IR and Quasirelativistic Density Functional Theory Investigation of the Reaction Products of Laser-Ablated Uranium Atoms with NO, NO<sub>2</sub> and N<sub>2</sub>O," *J. Chem. Phys.* **1997**, *106*, 5894-5903.
443. D. V. Lanzisera, L. Andrews, and P. R. Taylor, "Reactions of Laser-Ablated Boron Atoms with HCN during Condensation in Argon. A Comparison of Matrix Infrared and DFT, CCSD(T), and CASSCF Frequencies of BNC, BCN, HBNC, and HBCN," *J. Phys. Chem. A* **1997**, *101*, 7134-7140.
444. L. Andrews, W. D. Bare, and G. V. Chertihin, "Reactions of Laser-Ablated V, Cr, and Mn Atoms with Nitrogen Atoms and Molecules. Infrared Spectra and Density Functional Calculations on Metal Nitrides and Dinitrogen Complexes," *J. Phys. Chem. A* **1997**, *101*, 8417-8427.
445. G. V. Chertihin and L. Andrews, "Reactions of Laser-Ablated Manganese Atoms with Dioxygen. Infrared Spectra of MnO, OMnO, Mn(O<sub>2</sub>), (MnO)<sub>2</sub>, and Higher Oxide Complexes in Solid Argon," *J. Phys. Chem. A* **1997**, *101*, 8547-8553.
446. G. V. Chertihin, A. Citra, L. Andrews, and C. W. Bauschlicher, Jr., "Reactions of Laser-Ablated Cobalt Atoms with O<sub>2</sub>. Infrared Spectra of Cobalt Oxides in Solid Argon," *J. Phys. Chem. A* **1997**, *101*, 8793-8802.



447. L. Andrews, G. P. Kushto, J. T. Yustein, E. Archibong, R. Sullivan, and J. Leszczynski, "Reactions of Pulsed-Laser-Evaporated Thallium Atoms with O<sub>2</sub>. Matrix Infrared Spectra of New TlO<sub>2</sub> Species. Trends in Group 13 Dioxides and Dioxide Anions," *J. Phys. Chem. A* **1997**, *101*, 9077-9084.
448. G. V. Chertihin, L. Andrews, M. Rosi, and C. W. Bauschlicher, Jr., "Reactions of Laser-Ablated Scandium Atoms with Dioxygen. Infrared Spectra of ScO, OScO, (O<sub>2</sub>)ScO, (ScO)<sub>2</sub>, and Sc(O<sub>2</sub>)<sub>2</sub> in Solid Argon," *J. Phys. Chem. A* **1997**, *101*, 9085-9091.
449. D. V. Lanzisera and L. Andrews, "Reactions of Laser-Ablated Al, Ga, In, and Tl Atoms with Hydrogen Cyanide in Excess Argon. Matrix Infrared Spectra and Density Functional Theory Calculations on New Cyanide and Isocyanide Products," *J. Phys. Chem. A* **1997**, *101*, 9660-9665.
450. D. V. Lanzisera and L. Andrews, "Reactions of Laser-Ablated Mg, Ca, Sr, and Ba Atoms with Hydrogen Cyanide in Excess Argon. Matrix Infrared Spectra and Density Functional Calculations on Novel Isocyanide Products," *J. Phys. Chem. A* **1997**, *101*, 9666-9672.
451. J. C. Stephens, E. E. Bolton, H. F. Schaefer, III, and L. Andrews, "Quantum Mechanical Frequencies and Matrix Assignments to Al<sub>2</sub>H<sub>2</sub>," *J. Chem. Phys.* **1997**, *107*, 119-124.
452. G. V. Chertihin, W. D. Bare, and L. Andrews, "Reactions of Laser-ablated Chromium Atoms with Dioxygen. Infrared Spectra of CrO, OCrO, CrOO, CrO<sub>3</sub>, Cr(OO)<sub>2</sub>, Cr<sub>2</sub>O<sub>2</sub>, Cr<sub>2</sub>O<sub>3</sub> and Cr<sub>2</sub>O<sub>4</sub> in Solid Argon," *J. Chem. Phys.* **1997**, *107*, 2798-2806.
453. D. V. Lanzisera, P. Hassanzadeh, Y. Hannachi, and L. Andrews, "Identification of the Borirene Molecule, (CH)<sub>2</sub>BH. Matrix Isolation FTIR and DFT Calculations for Five Vibrational Modes of Six Isotopic Molecules," *J. Am. Chem. Soc.* **1997**, *119*, 12402-12403.
454. N. Galland, Y. Hannachi, D. V. Lanzisera, and L. Andrews, "Theoretical Study of Structures, Energetics and Vibrational Properties of BC<sub>2</sub>H<sub>3</sub> Species," *Chem. Phys.* **1998**, *230*, 143-151.
455. G. V. Chertihin, L. Andrews, and C. W. Bauschlicher, Jr., "Reactions of Laser-Ablated Scandium Atoms with Nitrogen: Matrix Infrared Spectra and DFT Calculations for Scandium Nitrides and the Fixation of Nitrogen by Two Scandium Atoms," *J. Am. Chem. Soc.* **1998**, *120*, 3205-3212.
456. L. Andrews, A. Citra, G. V. Chertihin, W. D. Bare, and M. Neurock, "Reactions of Laser-Ablated Co and Ni Atoms with Nitrogen Atoms and Molecules. Infrared Spectra and DFT Calculations of Metal Nitride Molecular Species and Complexes," *J. Phys. Chem. A* **1998**, *102*, 2561-2571.
457. L. Andrews, D. V. Lanzisera, P. Hassanzadeh, and Y. Hannachi, "Reactions of Laser-Ablated Boron Atoms with Ethylene and Ethane. Infrared Spectra and DFT Calculations for Several Novel BC<sub>2</sub>H<sub>x</sub> (x = 1, 2, 3, 4, 5) Molecules," *J. Phys. Chem. A* **1998**, *102*, 3259-3267.

458. G. V. Chertihin, W. D. Bare, and L. Andrews, "Reactions of Yttrium and Lanthanum Atoms with Nitrogen. Infrared Spectra of the Metal Nitrides and Dinitrogen Complexes in Solid Argon and Nitrogen," *J. Phys. Chem. A* **1998**, *102*, 3697-3704.
459. T. M. Greene, D. V. Lanzisera, L. Andrews, and A. J. Downs, "A Matrix-Isolation and Density Functional Theory Study of the Reactions of Laser-Ablated Beryllium, Magnesium, and Calcium Atoms with Methane," *J. Am. Chem. Soc.* **1998**, *120*, 6097-6104.
460. L. Andrews, M. F. Zhou, and W. D. Bare, "Matrix Infrared Spectra and Density Functional Calculations of Three Al, N, O Isomers," *J. Phys. Chem. A* **1998**, *102*, 5019-5026.
461. G. V. Chertihin and L. Andrews, "On the Spectrum and Structure of the Isolated  $O_4^-$  Anion in Solid Argon," *J. Chem. Phys.* **1998**, *108*, 6404-6407.
462. G. P. Kushto, P. F. Souter, and L. Andrews, "An Infrared Spectroscopic and Quasirelativistic Theoretical Study of the Coordination and Activation of Dinitrogen by Thorium and Uranium Atoms," *J. Chem. Phys.* **1998**, *108*, 7121-7130.
463. M. F. Zhou and L. Andrews, "Reactions of Laser-Ablated Chromium Atoms with Nitric Oxide: Infrared Spectra of  $NCrO$ ,  $Cr-(\eta^1-NO)_x$  ( $x = 1, 2, 3, 4$ ), and  $Cr-\eta^2-NO$  in Solid Argon," *J. Phys. Chem. A* **1998**, *102*, 7452-7461.
464. M. F. Zhou and L. Andrews, "Reactions of Laser-Ablated Niobium and Tantalum Atoms with Oxygen Molecules: Infrared Spectra of Niobium and Tantalum Oxide Molecules, Anions, and Cations," *J. Phys. Chem. A* **1998**, *102*, 8251-8260.
465. W. D. Bare, P. F. Souter, and L. Andrews, "Reactions of Laser-Ablated Molybdenum and Tungsten Atoms with Dioxygen. Resolved Infrared Spectra of Natural Molybdenum and Tungsten Isotopic Oxides in Argon Matrices," *J. Phys. Chem. A* **1998**, *102*, 8279-8286.
466. W. D. Bare and L. Andrews, "Formation of Grignard Species from the Reaction of Methyl Halides with Laser-Ablated Magnesium Atoms. A Matrix Infrared Study of  $CH_3MgF$ ,  $CH_3MgCl$ ,  $CH_3MgBr$ , and  $CH_3MgI$ ," *J. Am. Chem. Soc.* **1998**, *120*, 7293-7301.
467. L. Andrews, M. F. Zhou, S. P. Willson, G. P. Kushto, A. Snis, and I. Panas, "Infrared Spectra of *cis* and *trans*- $(NO)_2^-$  Anions in Solid Argon," *J. Chem. Phys.* **1998**, *109*, 177-185.
468. M. F. Zhou and L. Andrews, "Reactions of Laser-Ablated Niobium, Tantalum, and Rhenium Atoms with Nitrogen Atoms and Molecules. Infrared Spectra and Density Functional Calculations of the Metal Nitride and Dinitride Molecules," *J. Phys. Chem. A* **1998**, *102*, 9061-9071.

469. M. F. Zhou and L. Andrews, "Reactions of Laser-Ablated Niobium and Tantalum Atoms with NO. Infrared Spectra of the NMO,  $M(\eta^1\text{-NO})_x$  ( $x = 2, 3$ ), and  $(\text{N}_2)(\text{MO}_2)$  Molecules in Solid Argon," *J. Phys. Chem. A* **1998**, *102*, 10025-10031.
470. L. Andrews, M. F. Zhou, and D. W. Ball, "Reactions of Manganese and Rhenium Atoms with NO. Infrared Spectra and Density Functional Calculations of  $\eta^1$  and  $\eta^2$  Addition and Insertion Reaction Products," *J. Phys. Chem. A* **1998**, *102*, 10041-10050.
471. S. P. Willson and L. Andrews, "Characterization of the Reaction Products of Laser-Ablated Early Lanthanide Metal Atoms with Dinitrogen. Infrared Spectra of  $\text{LnN}$ ,  $\text{LnN}_2$ ,  $(\text{LnN})_2$ , and  $\text{Ln}(\text{NN})_x$  Molecules," *J. Phys. Chem. A* **1998**, *102*, 10238-10249.
472. M. F. Zhou and L. Andrews, "Matrix Infrared Spectra and Density Functional Calculations of  $\text{Co}(\text{CO})_x^-$  ( $x = 1,2,3,4$ ) Anions," *J. Phys. Chem. A* **1998**, *102*, 10250-10257.
473. M. F. Zhou and L. Andrews, "Matrix Infrared Spectra and Density Functional Calculations of  $\text{Ni}(\text{CO})_x^-$ ,  $x = 1-3$ ," *J. Am. Chem. Soc.* **1998**, *120*, 11499-11503.
474. M. F. Zhou, G. V. Chertihin, and L. Andrews, "Reactions of Laser-Ablated Iron Atoms with Carbon Monoxide: Infrared Spectra and Density Functional Calculations of  $\text{Fe}_x\text{CO}$ ,  $\text{Fe}(\text{CO})_x$ , and  $\text{Fe}(\text{CO})_x^-$  in Solid Argon," *J. Chem. Phys.* **1998**, *109*, 10893-10904.
475. M. F. Zhou and L. Andrews, "Infrared Spectra and Density Functional Calculations for  $\text{OScCO}$ ,  $\text{Sc}-(\eta^2\text{-OC})\text{O}$ ,  $\text{OSc}-(\eta^2\text{-CO})$ , and Three  $\text{OScCO}^+$  Cation Isomers in Solid Argon," *J. Am. Chem. Soc.* **1998**, *120*, 13230-13238.
476. L. Andrews, "Reactions of Laser-Ablated First-Row Transition Metal Atoms with Nitrogen. Matrix Infrared Spectra of the  $\text{MN}$ ,  $\text{NMN}$  and  $(\text{MN})_2$  Molecules," *J. Electron Spectrosc. and Related Phenomena* **1998**, *97*, 63-75.
477. M. F. Zhou and L. Andrews, "Reactions of Laser-Ablated Vanadium Atoms with Nitric Oxide. Infrared Spectra and Density Functional Calculations on  $\text{NVO}$ ,  $\text{V}-\eta^1\text{-NO}$ ,  $\text{V}-(\eta^1\text{-NO})_2$ ,  $\text{V}-(\eta^1\text{-NO})_3$  and  $\text{V}-\eta^2\text{-NO}$ ," *J. Phys. Chem. A* **1999**, *103*, 478-484.
478. W. D. Bare and L. Andrews, "A Lecture Demonstration of Ideal Gas Principles Using a Football," *J. Chem. Ed.* **1999**, *76*, 622-624.
479. M. F. Zhou and L. Andrews, "Infrared Spectra of the  $\text{CO}_2^-$  and  $\text{C}_2\text{O}_4^-$  Anions Isolated in Solid Argon," *J. Chem. Phys.* **1999**, *110*, 2414-2422.
480. L. Andrews, G. P. Kushto, M. F. Zhou, S. P. Willson, and P. F. Souter, "Infrared Spectrum of  $\text{CCH}^+$  in Solid Argon and Neon," *J. Chem. Phys.* **1999**, *110*, 4457-4466.
481. M. F. Zhou and L. Andrews, "Infrared Spectra of the  $\text{C}_2\text{O}_4^+$  Cation and  $\text{C}_2\text{O}_4^-$  Anion Isolated in Solid Neon," *J. Chem. Phys.* **1999**, *110*, 6820-6826.

482. G. P. Kushto, M. F. Zhou, L. Andrews, and C. W. Bauschlicher, Jr., "An Infrared Spectroscopic and Density Functional Theoretical Investigation of the Reaction Products of Laser-Ablated Scandium and Titanium Atoms with Nitric Oxide," *J. Phys. Chem. A* **1999**, *103*, 1115-1125.
483. M. F. Zhou, B. Liang, and L. Andrews, "Infrared Spectra of OMCO (M=Cr-Ni), OMCO<sup>-</sup> (M=Cr-Cu) and MCO<sub>2</sub><sup>-</sup> (M=Co-Cu) in Solid Argon," *J. Phys. Chem. A* **1999**, *103*, 2013-2023.
484. M. F. Zhou and L. Andrews, "Infrared Spectra and Density Functional Calculations for OMCO, OM(CO), OMCO<sup>+</sup> and OMOC<sup>+</sup> (M=V,Ti) in Solid Argon," *J. Phys. Chem. A* **1999**, *103*, 2066-2075.
485. M. F. Zhou and L. Andrews, "Matrix Infrared Spectra and Density Functional Calculations of ScCO, ScCO<sup>-</sup> and ScCO<sup>+</sup>," *J. Phys. Chem. A* **1999**, *103*, 2964-2971.
486. S. P. Willson and L. Andrews, "Characterization of the Reaction Products of Laser-Ablated Early Lanthanide Metal Atoms with Molecular Oxygen. Infrared Spectra of LnO, LnO<sup>+</sup>, LnO<sup>-</sup>, LnO<sub>2</sub>, LnO<sub>2</sub><sup>+</sup>, LnO<sub>2</sub><sup>-</sup>, LnO<sub>3</sub><sup>-</sup> and (LnO)<sub>2</sub> in Solid Argon," *J. Phys. Chem. A* **1999**, *103*, 3171-3183.
487. A. Citra and L. Andrews, "Reactions of Laser-Ablated Rhodium Atoms with Nitrogen Atoms and Molecules. Infrared Spectra and Density Functional Calculations on Rhodium Nitrides and Dinitrogen Complexes," *J. Phys. Chem. A* **1999**, *103*, 3410-3417.
488. L. Andrews and M. F. Zhou, "Reactions of Laser-Ablated Molybdenum and Tungsten Atoms with Nitric Oxide. Infrared Spectra of the MN, NMO, and M-η<sup>1</sup>-(NO)<sub>x</sub> (x = 1, 2, 3, 4) Molecules and (NO)<sub>2</sub><sup>+</sup> and (NO)<sub>2</sub><sup>-</sup> Ions in Solid Argon," *J. Phys. Chem. A* **1999**, *103*, 4167-4173.
489. A. Citra and L. Andrews, "Reactions of Laser-Ablated Iridium Atoms with O<sub>2</sub>. Infrared Spectra and DFT Calculations for Iridium Dioxide and Peroxo Iridium(VI) Dioxide in Solid Argon," *J. Phys. Chem. A*, **1999**, *103*, 4182-4190.
490. L. Andrews, P. F. Souter, W. D. Bare, and B. Liang, "Reactions of Laser-Ablated Mo and W Atoms with Dinitrogen: Infrared Spectra of Metal Nitrides, Dinitrides, and Complexes in Solid Argon and Nitrogen," *J. Phys. Chem. A* **1999**, *103*, 4649-4658.
491. G. P. Kushto and L. Andrews, "Infrared Spectroscopic and Density Functional Theoretical Investigation of the Reaction Products of Laser-Ablated Zr, Hf, and Th Atoms with Nitric Oxide," *J. Phys. Chem. A* **1999**, *103*, 4836-4844.
492. A. Citra and L. Andrews, "Reactions of Laser-Ablated Rhodium Atoms with O<sub>2</sub>. Infrared Spectra and DFT Calculations for RhO, ORhO, (O<sub>2</sub>)RhO<sub>2</sub>, Rh<sub>2</sub>O<sub>2</sub>, Rh(O<sub>2</sub>) and (O<sub>2</sub>)Rh(O<sub>2</sub>) in Solid Argon," *J. Phys. Chem. A* **1999**, *103*, 4845-4854.

493. M.F. Zhou and L. Andrews, "Infrared Spectra and Density Functional Calculations of Small Vanadium and Titanium Carbonyl Molecules and Anions in Solid Anions," *J. Phys. Chem. A* **1999**, *103*, 5259-5268.
494. W. D. Bare, A. Citra, G. V. Chertihin, and L. Andrews, "Reactions of Laser-Ablated Platinum and Palladium Atoms with Dioxygen. Matrix Infrared Spectra and Density Functional Calculations of Platinum Oxides and Complexes and Palladium Complexes," *J. Phys. Chem. A* **1999**, *103*, 5456-5462.
495. C. W. Bauschlicher, Jr., M. F. Zhou, L. Andrews, J. R. T. Johnson, I. Panas, A. Snis, and B. O. Roos, "A Further Study of the Products of Scandium and Dioxygen Reactions," *J. Phys. Chem. A* **1999**, *103*, 5463-5467.
496. L. Andrews, M. F. Zhou, G. V. Chertihin, and C. W. Bauschlicher, Jr., "Reactions of Laser-Ablated Y and La Atoms, Cations and Electrons with O<sub>2</sub>. Infrared Spectra and Density Functional Calculations of the MO, MO<sup>+</sup>, MO<sub>2</sub>, MO<sub>2</sub><sup>+</sup>, and MO<sub>2</sub><sup>-</sup> Species in Solid Argon," *J. Phys. Chem. A* **1999**, *103*, 6525-6532.
497. M. F. Zhou and L. Andrews, "Reactions of Laser-Ablated Co, Rh, and Ir with CO: Infrared Spectra and Density Functional Calculations of the Metal Carbonyl Molecules, Cations and Anions in Solid Neon," *J. Phys. Chem. A* **1999**, *103*, 7773-7784.
498. M. F. Zhou and L. Andrews, "Infrared Spectra of CNbO, CMO<sup>-</sup>, OMCCO, (C<sub>2</sub>)MO<sub>2</sub>, and M(CO)<sub>x</sub> (x = 1-6) (M = Nb, Ta) in Solid Neon," *J. Phys. Chem. A* **1999**, *103*, 7785-7794.
499. G. P. Kushto, P. F. Souter, G. V. Chertihin, and L. Andrews, "An Infrared Spectroscopic and Density Functional Investigation of Dinitrogen Activation by Group IV Metal Atoms," *J. Chem. Phys.* **1999**, *110*, 9020-9031.
500. M. F. Zhou, J. Hacaloglu, and L. Andrews, "Infrared Spectra And Density Functional Calculations of Cyclic-O<sub>6</sub><sup>+</sup> and Trans-O<sub>6</sub><sup>+</sup> in Solid Neon and Argon," *J. Chem. Phys.* **1999**, *110*, 9450-9456.
501. M. F. Zhou and L. Andrews, "Reactions of Laser-ablated Iron Atoms and Cations with Carbon Monoxide: Infrared Spectra of FeCO<sup>+</sup>, Fe(CO)<sub>2</sub><sup>+</sup>, Fe(CO)<sub>x</sub>, and Fe(CO)<sub>x</sub><sup>-</sup> (x = 1-4) in Solid Neon," *J. Chem. Phys.* **1999**, *110*, 10370-10379.
502. M. F. Zhou and L. Andrews "Infrared Spectra and Density Functional Calculations of the CrO<sub>2</sub><sup>-</sup> MoO<sub>2</sub><sup>-</sup> and WO<sub>2</sub><sup>-</sup> Molecular Anions in Solid Neon," *J. Chem. Phys.* **1999**, *111*, 4230-4238.
503. M. F. Zhou and L. Andrews, "Infrared Spectra and Density Functional Calculations of Cu(CO)<sub>1-4</sub><sup>+</sup>, Cu(CO)<sub>1-3</sub>, and Cu(CO)<sub>1-3</sub><sup>-</sup> in Solid Neon," *J. Chem. Phys.* **1999**, *111*, 4548-4557.
504. L. Andrews and P. F. Souter, "HF Stretching-Bending Combination Bands for Small Complexes in Solid Argon," *J. Chem. Phys.* **1999**, *111*, 5995-5998.

505. L. Andrews and M. F. Zhou, "Infrared Spectra of  $(\text{NO})_2^-$  and  $(\text{NO})_2^+$  Isomers Trapped in Solid Neon," *J. Chem. Phys.* **1999**, *111*, 6036-6041.
506. M. F. Zhou and L. Andrews, "Infrared Spectra and Density Functional Calculations of  $\text{RuCO}^+$ ,  $\text{OsCO}^+$ ,  $\text{Ru}(\text{CO})_x$ ,  $\text{Os}(\text{CO})_x$ ,  $\text{Ru}(\text{CO})_x^-$  and  $\text{Os}(\text{CO})_x^-$  ( $x=1-4$ ) in Solid Neon," *J. Phys. Chem. A* **1999**, *103*, 6956-6968.
507. S. P. Willson and L. Andrews, "Characterization of the Reaction of Laser-Ablated Late Lanthanide Metal Atoms with Molecular Oxygen: Infrared Spectra of  $\text{LnO}$ ,  $\text{LnO}^+$ ,  $\text{LnO}^-$ ,  $\text{LnO}_2$ ,  $\text{LnO}_2^-$ ,  $\text{LnO}_3^-$ , and  $(\text{LnO})_2$  in Solid Argon," *J. Phys. Chem. A*, **1999**, *103*, 6972-6983.
508. M. F. Zhou and L. Andrews, "Infrared Spectra and Pseudopotential Calculations for  $\text{NUO}^+$ ,  $\text{NUO}$ , and  $\text{NThO}$  in Solid Neon," *J. Chem. Phys.* **1999**, *111*, 11044-11049.
509. M. F. Zhou and L. Andrews, "Infrared Spectra of  $\text{RhCO}^+$ ,  $\text{RhCO}$ , and  $\text{RhCO}^-$  in Solid Neon: A Scale for Charge in Supported  $\text{Rh}(\text{CO})$  Catalyst Systems," *J. Am. Chem. Soc.* **1999**, *121*, 9171-9175.
510. M. F. Zhou, L. Andrews, J. Li, and B. E. Bursten, "Reactions of Laser-Ablated Uranium Atoms with CO: Infrared Spectra of the  $\text{CUO}$ ,  $\text{CUO}^-$ ,  $\text{OUCCO}$ ,  $(\eta^2\text{-C}_2)\text{UO}_2$ , and  $\text{U}(\text{CO})_x$  ( $x=1-6$ ) Molecules in Solid Neon," *J. Am. Chem. Soc.* **1999**, *121*, 9712-9721.
511. A. Citra and L. Andrews, "Matrix Infrared Spectra of the Osmium and Ruthenium Dinitride Molecules. Evidence for Direct Insertion of Osmium into the Dinitrogen Bond at Cryogenic Temperatures," *J. Am. Chem. Soc.* **1999**, *121*, 11567-11568.
512. M. F. Zhou, L. Andrews, J. Li, and B. E. Bursten, "Reactions of Th Atoms with CO: The First Thorium Carbonyl Complex and an Unprecedented Bent Triplet Insertion Product," *J. Am. Chem. Soc.* **1999**, *121*, 12188-12189.
513. A. Citra and L. Andrews, "Reactions of Laser-Ablated Silver and Gold Atoms with Dioxygen and Density Functional Theory Calculations of Product Molecules," *Theo. Chem.* **1999**, *489*, 95-108.
514. H.-J. Himmel, A. J. Downs, T. M. Greene, and L. Andrews, "Methylgallium and Methylindium: The First Sighting of the Simplest Organic Derivatives of Ga(I) and In(I)," *Chem. Commun.* **1999**, 2243-2244.
515. L. Andrews, "Matrix Isolation Studies by Infrared and Raman Spectroscopies," *Encyclopedia of Spectroscopy and Spectrometry*, Academic Press, London, **1999**.
516. M. F. Zhou and L. Andrews, "Reactions of Zirconium and Hafnium Atoms with CO: Infrared Spectra and Density Functional Calculations of  $\text{M}(\text{CO})_x$ ,  $\text{OMCCO}$ , and  $\text{M}(\text{CO})_2^-$  ( $\text{M} = \text{Zr}, \text{Hf}; x = 1-4$ )," *J. Am. Chem. Soc.* **2000**, *122*, 1531-1539.
517. M. F. Zhou and L. Andrews, "Infrared Spectra of the  $\text{CS}_2^-$ ,  $\text{CS}_2^+$ , and  $\text{C}_2\text{S}_4^+$  Molecular Ions in Solid Neon and Argon," *J. Chem. Phys.* **2000**, *112*, 6576-6582.

518. N. Galland, Y. Hannachi, D. V. Lanzisera, and L. Andrews, "Theoretical Study of Structures, Energetics and Vibrational Properties of  $\text{BC}_2\text{H}_5$  Species," *Chem. Phys.* **2000**, 255, 205-215.
519. A. Citra and L. Andrews, "Reactions of Laser-Ablated Osmium and Ruthenium Atoms with Nitrogen. Matrix Infrared Spectra and Density Functional Calculations of Osmium and Ruthenium Nitrides and Dinitrides," *J. Phys. Chem. A* **2000**, 104, 1152-1161.
520. S. P. Willson and L. Andrews, "Characterization of the Reaction Products of Laser-Ablated Lanthanide Metal Atoms with Molecular Hydrogen. Infrared Spectra of  $\text{LnH}$ ,  $\text{LnH}_2$ ,  $\text{LnH}_3$ , and  $\text{LnH}_4$  Molecules in Solid Argon," *J. Phys. Chem. A* **2000**, 104, 1640-1647.
521. M. F. Zhou and L. Andrews, "Reactions of Laser-Ablated Ga, In, and Tl Atoms with Nitrogen Atoms and Molecules. Infrared Spectra and Density Functional Calculations of  $\text{GaN}$ ,  $\text{NGaN}$ ,  $\text{NInN}$ , and the  $\text{M}_3\text{N}$  and  $\text{MN}_3$  Molecules," *J. Phys. Chem. A* **2000**, 104, 1648-1655.
522. L. Andrews, M. F. Zhou, G. V. Chertihin, W. D. Bare, and Y. Hannachi, "Reactions of Laser-Ablated Aluminum Atoms with Nitrogen Atoms and Molecules. Infrared Spectra and Density Functional Calculations for the  $\text{AlN}_2$ ,  $\text{Al}_2\text{N}$ ,  $\text{Al}_2\text{N}_2$ ,  $\text{AlN}_3$  and  $\text{Al}_3\text{N}$  Molecules," *J. Phys. Chem. A* **2000**, 104, 1656-1661.
523. W. D. Bare, A. Citra, C. Trindle, and L. Andrews, "Matrix Infrared Spectroscopic Study of Magnesium Carbene and Carbenoid Radicals and Analysis of Their Bonding with Density Functional Calculations," *Inorg. Chem.* **2000**, 39, 1204-1215.
524. M. F. Zhou and L. Andrews, "Reactions of Laser-Ablated Cu with NO: Infrared Spectra and Density Functional Calculations of  $\text{CuNO}^+$ ,  $\text{CuNO}$ ,  $\text{Cu}(\text{NO})_2$  and  $\text{Cu}(\text{NO})_2^-$  in Solid Neon and Argon," *J. Phys. Chem. A* **2000**, 104, 2618-2625.
525. S. P. Willson, L. Andrews, and M. Neurock, "Characterization of the Reaction Products of Laser-Ablated Lanthanide Metal Atoms with Nitric Oxide. Infrared Spectra of the  $\text{NLnO}$  Molecules in Solid Argon," *J. Phys. Chem. A* **2000**, 104, 3446-3456.
526. M. F. Zhou, A. Citra, B. Liang, and L. Andrews, "Infrared Spectra and Density Functional Calculations of  $\text{MO}_2$ ,  $\text{MO}_3$ ,  $(\text{O}_2)\text{MO}_2$ ,  $\text{MO}_4$ ,  $\text{MO}_2^-$  ( $\text{M}=\text{Re}$ ,  $\text{Ru}$ ,  $\text{Os}$ ) and  $\text{ReO}_3^-$   $\text{ReO}_4^-$  in Solid Neon and Argon," *J. Phys. Chem. A* **2000**, 104, 3457-3465.
527. C. W. Bauschlicher, Jr., M. F. Zhou, and L. Andrews, "A Study of Products of the Reaction of Phosphorus and Dioxygen," *J. Phys. Chem. A* **2000**, 104, 3566-3571.
528. B. Liang, M. F. Zhou, and L. Andrews, "Reactions of Laser-Ablated Ni, Pd, and Pt Atoms with Carbon Monoxide: Matrix Infrared Spectra and Density Functional

- Calculations on  $M(\text{CO})_n$  ( $n = 1-4$ ),  $M(\text{CO})_n^-$  ( $n = 1-3$ ), and  $M(\text{CO})_n^+$  ( $n = 1-2$ ), ( $M = \text{Ni}, \text{Pd}, \text{Pt}$ ),” *J. Phys. Chem. A* **2000**, *104*, 3905-3914.
529. M. F. Zhou and L. Andrews, “Reactions of Laser-Ablated Fe, Co, and Ni with NO: Infrared Spectra and Density Functional Calculations of  $\text{MNO}^+$  and  $\text{M}(\text{NO})_x$  ( $M = \text{Fe}, \text{Co}$ ,  $x = 1-3$ ;  $M = \text{Ni}$ ,  $x = 1,2$ ), and  $\text{M}(\text{NO})_x^-$  ( $M = \text{Co}, \text{Ni}$ ;  $x = 1,2$ ),” *J. Phys. Chem. A* **2000**, *104*, 3915-3925.
530. M. F. Zhou and L. Andrews, “Reactions of Co, Ni and Cu atoms with  $\text{CS}_2$ : Infrared Spectra and Density Functional Calculations of  $\text{SMCS}$ ,  $\text{M}-(\eta^2\text{-CS})\text{S}$ ,  $\text{M-CS}_2$  and  $\text{MCS}_2^+$  in Solid Argon,” *J. Phys. Chem. A* **2000**, *104*, 4394-4401.
531. M. F. Zhou, L. Andrews, N. Ismail, and C. Marsden, “Infrared Spectra of  $\text{UO}_2$ ,  $\text{UO}_2^+$ , and  $\text{UO}_2^-$  in Solid Neon,” *J. Phys. Chem. A* **2000**, *104*, 5495-5502.
532. G. P. Kushto, F. Ding, B. Liang, X. F. Wang, A. Citra, and L. Andrews, “Infrared Spectra of  $\text{BeNO}$  and  $\text{MgNO}$  in Solid Argon,” *Chem. Phys.* **2000**, *257*, 223-233.
533. H.-J. Himmel, A. J. Downs, T. M. Greene, and L. Andrews, “Matrix Photochemistry of Gallium and Indium Atoms ( $M$ ) in the Presence of Methane: Formation and Characterization of the Divalent Species  $\text{CH}_3\text{MH}$  and Univalent Species  $\text{CH}_3\text{M}$ ,” *Organometallics* **2000**, *19*, 1060-1070.
534. X. F. Wang, M. F. Zhou, and L. Andrews, “Manganese Carbonyl Nitrosyl Complexes in Solid Argon: Infrared Spectra and Density Functional Calculations,” *J. Phys. Chem. A* **2000**, *104*, 7964-7973.
535. A. Citra and L. Andrews, “Reaction of Laser-Ablated Palladium and Platinum Atoms with Nitric Oxide: Infrared Spectra and Density Functional Calculations of  $\text{MNO}^{+,0,-}$  and  $\text{M}(\text{NO})_2$  in Solid Argon and Neon,” *J. Phys. Chem. A* **2000**, *104*, 8160-8172.
536. L. Andrews, A. Rohrbacher, C. M. Laperle, and R. E. Continetti, “Laser Desorption/Ionization of Transition Metal Atoms and Oxides from Solid Argon,” *J. Phys. Chem. A* **2000**, *104*, 8173-8177.
537. L. Andrews, M. F. Zhou, and X. F. Wang, “Matrix Infrared Spectra and Density Functional Calculations for  $\text{GaNO}$ ,  $\text{InNO}$ , and  $\text{TlNO}$ ,” *J. Phys. Chem. A* **2000**, *104*, 8475-8479.
538. A. Citra and L. Andrews, “Reactions of Laser-Ablated Osmium and Ruthenium Atoms with Nitric Oxide in Neon and Argon. Matrix Infrared Spectra and Density Functional Calculations of  $\text{Os}(\text{NO})_{1-3}$ ,  $\text{Ru}(\text{NO})_{1-3}$ ,  $\text{NOsO}$ ,  $\text{NRuO}$ ,  $\text{OsNO}^+$  and  $\text{RuNO}^+$ ,” *J. Phys. Chem. A* **2000**, *104*, 8689-8701.
539. L. Andrews, M. F. Zhou, X. F. Wang, and C. W. Bauschlicher, Jr., “Matrix Infrared Spectra and Density Functional Calculations of Manganese and Rhenium Carbonyl Neutral and Anion Complexes,” *J. Phys. Chem. A* **2000**, *104*, 8887-8897.



540. B. Liang and L. Andrews, "Reactions of Laser-Ablated Ag and Au Atoms with Carbon Monoxide: Matrix Infrared Spectra and Density Functional Calculations on  $\text{Ag}(\text{CO})_n$  ( $n = 2,3$ ),  $\text{Au}(\text{CO})_n$  ( $n = 1,2$ ) and  $\text{M}(\text{CO})_n^+$  ( $n = 1-4$ ;  $\text{M} = \text{Ag}, \text{Au}$ )," *J. Phys. Chem. A* **2000**, *104*, 9156-9164.
541. D. V. Lanzisera and L. Andrews, "Reactions of Laser-Ablated Boron Atoms with Methyl Halides in Excess Argon. Infrared Spectra and Density Functional Theory Calculations on  $\text{CH}_3\text{BX}$ ,  $\text{CH}_2\text{BX}$ , and  $\text{CHBX}$  ( $\text{X} = \text{F}, \text{Cl}, \text{Br}$ )," *J. Phys. Chem. A* **2000**, *104*, 9295-9301.
542. X. F. Wang and L. Andrews, "Reactions of Laser-Ablated Ruthenium Atoms with CO and  $\text{H}_2$  Mixtures: Infrared Spectra and Density Functional Theory Calculations of  $\text{H}_2\text{Ru}(\text{CO})_x$  ( $x = 2-4$ ) and  $(\text{H}_2)\text{RuCO}$ ," *J. Phys. Chem. A* **2000**, *104*, 9892-9900.
543. X. F. Wang, M. F. Zhou, and L. Andrews, "Reactions of Iron Atoms with Nitric Oxide and Carbon Monoxide in Excess Argon: Infrared Spectra and Density Functional Calculations of Iron Carbonyl Nitrosyl Complexes," *J. Phys. Chem. A* **2000**, *104*, 10104-10111.
544. L. Andrews, L. Manceron, M. E. Alikhani, and X. F. Wang, "Observed and Calculated Infrared Spectrum of  $\text{Pd}(\text{H}_2)$  in Solid Argon: A Ligand-Free Side-Bonded Molecular Hydrogen Complex," *J. Am. Chem. Soc.* **2000**, *122*, 11011-11012.
545. L. Andrews, M. F. Zhou, B. Liang, J. Li, and B. E. Bursten, "Reactions of Laser-Ablated U and Th with  $\text{CO}_2$ : Neon Matrix Infrared Spectra and Density Functional Calculations of  $\text{OUCO}$ ,  $\text{OThCO}$ , and Other Products," *J. Am. Chem. Soc.* **2000**, *122*, 11440-11449.
546. A. Citra and L. Andrews, "Reactions of Laser-Ablated Rhodium and Iridium Atoms with Nitric Oxide in Neon and Argon. Matrix Infrared Spectra and Density Functional Calculations of  $\text{Rh}(\text{NO})_{1-3}$ ,  $\text{Ir}(\text{NO})_{1-3}$ ,  $\text{NRhO}$ ,  $\text{NIrO}$ ,  $\text{RhNO}^+$ , and  $\text{IrNO}^+$ ," *J. Phys. Chem. A* **2000**, *104*, 11897-11908.
547. L. Andrews, M. Zhou, G. V. Chertihin, W. D. Bare, and Y. Hannachi, "Reactions of Laser-Ablated Aluminum Atoms with Nitrogen During Condensation at 10 K. Infrared Spectra and Density Functional Calculations for  $\text{Al}_x\text{N}_y$  Molecular Species," *Low Temp. Phys.* **2000**, *26*, 736-743.
548. L. Andrews, B. Liang, J. Li, and B. E. Bursten, "Ground-State Reversal by Matrix Interaction: Electronic States and Vibrational Frequencies of  $\text{CUO}$  in Solid Argon and Neon," *Angew. Chem. Int. Ed.* **2000**, *39*, 4565-4567.
549. L. Andrews, X. F. Wang, and L. Manceron, "Infrared Spectra and Density Functional Calculations of Platinum Hydrides," *J. Chem. Phys.* **2001**, *114*, 1559-1566.
550. L. Andrews, X. F. Wang, M. E. Alikhani, and L. Manceron, "Observed and Calculated Infrared Spectra of  $\text{Pd}(\text{H}_2)_{1,2,3}$  Complexes and Palladium Hydrides in Solid Argon and Neon," *J. Phys. Chem. A* **2001**, *105*, 3052-3063.

551. X. F. Wang and L. Andrews, "Precious Metal-Molecular Oxygen Complexes: Neon Matrix Infrared Spectra and Density Functional Calculations for  $M(O_2)$ ,  $M(O_2)_2$  ( $M = Pd, Pt, Ag, Au$ )," *J. Phys. Chem. A* **2001**, *105*, 5812-5822.
552. A. Citra and L. Andrews, "A Spectroscopic and Theoretical Investigation of Charge Transfer Complexes Between Silver and Nitric Oxide: Infrared Spectra and Density Functional Calculations of  $AgNO^{+,0,-}$  and  $Ag_x(NO)_y$  Clusters ( $x,y=1,2$ ) in Solid Argon and Neon," *J. Phys. Chem. A* **2001**, *105*, 3042-3051.
553. L. Andrews, X. F. Wang and Z. Mielke, "Infrared Spectrum of the  $H_3N-HCl$  Complex in Solid Neon," *J. Am. Chem. Soc.* **2001**, *123*, 1499-1500.
554. L. Andrews and B. Liang, "Infrared Spectrum of the Hyponitrite Dianion,  $N_2O_2^{2-}$ , Isolated and Insulated from Stabilizing Metal Cations in Solid Argon," *J. Am. Chem. Soc.* **2001**, *123*, 1997-2002.
555. X. F. Wang and L. Andrews, "Cobalt Carbonyl Nitrosyl Complexes: Matrix Infrared Spectra and Density Functional Calculations," *J. Phys. Chem. A* **2001**, *105*, 4403-4409.
556. L. Andrews, X. F. Wang, and Z. Mielke, "Infrared Spectrum of the  $H_3N-HCl$  Complex in Solid Ne, Ne/Ar, Ar, and Kr. Matrix Effects on a Strong Hydrogen-Bonded Complex," *J. Phys. Chem. A* **2001**, *105*, 6054-6064.
557. L. Andrews and X. F. Wang, "Infrared Spectra of the  $H_3N-HBr$  Complex in Solid Neon, Ne/Ar, Ar, Kr, and  $N_2$ . Strong Matrix Effects on a Hydrogen-Bonded Complex," *J. Phys. Chem. A* **2001**, *105*, 6420-6429.
558. D. Danset, L. Manceron, and L. Andrews, "Vibrational Spectra of Nickel and Platinum Dioxide Molecules Isolated in Solid Argon," *J. Phys. Chem. A* **2001**, *105*, 7205-7210.
559. L. Andrews and X. F. Wang, "Infrared Spectrum of the  $H_3N-HI$  Complex in Solid Ne, Ar, Ne/Ar, Kr, and  $N_2$ . Comparisons of Matrix Effects on Hydrogen-Bonded Complexes," *J. Phys. Chem. A* **2001**, *105*, 7541-7550.
560. A. Citra, X. F. Wang, W. D. Bare, and L. Andrews, "Reactions of Laser-Ablated Platinum with Nitrogen: Matrix Infrared Spectra of Platinum Nitride, Complexes, and Anions," *J. Phys. Chem. A* **2001**, *105*, 7799-7811.
561. M. F. Zhou, L. Andrews, and C. W. Bauschlicher, Jr., "Spectroscopic and Theoretical Investigations of Binary Unsaturated Transition Metal Carbonyl Cations, Neutrals and Anions," *Chem. Rev.* **2001**, *101*, 1931-1961.
562. J. Li, B. E. Bursten, M. F. Zhou, and L. Andrews, "A Combined Experimental and Theoretical Study of the Reaction Products of Laser-Ablated Thorium Atoms with CO: First Identification of the  $CThO$ ,  $CThO^-$ ,  $OThCCO$ ,  $OTh(\eta^3-CCO)$  and  $Th(CO)_n$  ( $n = 1 - 6$ ) Molecules," *Inorg. Chem.* **2001**, *40*, 5448-5460.

563. B. Liang and L. Andrews, "Infrared Spectra of *cis*- and *trans*-Peroxyxynitrite Anion,  $\text{OONO}^-$ , in Solid Argon," *J. Am. Chem. Soc.* **2001**, *123*, 9848-9854.
564. X. F. Wang and L. Andrews, "Gold Hydrides AuH and  $(\text{H}_2)\text{AuH}$  and the  $\text{AuH}_3$  Transition State Stabilized in  $(\text{H}_2)\text{AuH}_3$ : Infrared Spectra and DFT Calculations," *J. Am. Chem. Soc.* **2001**, *123*, 12899-12900.
565. L. Andrews, X. F. Wang, M. F. Zhou, and B. Liang, "Infrared Spectrum of the Hyponitrite Dianion,  $\text{N}_2\text{O}_2^{2-}$ , Isolated and Insulated from Stabilizing Metal Cations in Solid Neon," *J. Phys. Chem. A* **2002**, *106*, 92-95.
566. B. Liang and L. Andrews, "Reactions of Laser-Ablated Rhenium Atoms with Carbon Dioxide: Matrix Infrared Spectra and Density Functional Calculations on  $\text{ORECO}$ ,  $\text{O}_2\text{ReCO}$ ,  $\text{ORECO}_2$ ,  $\text{O}_2\text{Re}(\text{CO})_2$ ,  $\text{ORECO}^-$ , and  $\text{ORE}(\text{CO})_2^-$ ," *J. Phys. Chem. A* **2002**, *106*, 595-602.
567. L. Andrews and X. F. Wang, "Infrared Spectra and Density Functional Calculations for Early First-Row Transition Metal Nitrosyls in Solid Neon," *J. Phys. Chem. A* **2002**, *106*, 1196-1204.
568. X. F. Wang and L. Andrews, "Rhodium Dinitrogen Complexes  $\text{Rh}(\text{NN})_x$  ( $x = 1-3$ ) and Anions: Matrix Infrared Spectra and DFT Calculations," *J. Phys. Chem. A* **2002**, *106*, 2457-2464.
569. A. Citra, X. F. Wang, and L. Andrews, "Reactions of Laser-Ablated Gold with Nitric Oxide: Infrared Spectra and DFT Calculations of  $\text{AuNO}$  and  $\text{Au}(\text{NO})_2$  in Solid Argon and Neon," *J. Phys. Chem. A* **2002**, *106*, 3287-3293.
570. X. F. Wang and L. Andrews, "Infrared Spectra of Rhodium Hydrides in Solid Argon, Neon, and Deuterium with Supporting Density Functional Calculations," *J. Phys. Chem. A* **2002**, *106*, 3706-3713.
571. B. Liang and L. Andrews, "Infrared Spectra and Density Functional Theory Calculations of Group V Transition Metal Sulfides," *J. Phys. Chem. A* **2002**, *106*, 3738-3743.
572. X. F. Wang and L. Andrews, "Infrared Spectra and DFT Calculations for the Gold Hydrides AuH,  $(\text{H}_2)\text{AuH}$ , and the  $\text{AuH}_3$  Transition State Stabilized in  $(\text{H}_2)\text{AuH}_3$ ," *J. Phys. Chem. A* **2002**, *106*, 3744-3748.
573. J. Li, B. E. Bursten, B. Liang, and L. Andrews, "Noble Gas-Actinide Compounds: Complexation of the  $\text{CUO}$  Molecule by Ar, Kr, and Xe Atoms in Noble Gas Matrices," *Science* **2002**, *295*, 2242-2245.
574. L. Andrews and A. Citra, "Infrared Spectra and Density Functional Theory Calculations on Transition Metal Nitrosyls. Vibrational Frequencies of Unsaturated Transition Metal Nitrosyls," *Chem. Rev.* **2002**, *102*, 885-911.

575. B. Liang, L. Andrews, N. Ismail, and C. J. Marsden, "The First Infrared Spectra and Quasirelativistic DFT Studies of the US, US<sub>2</sub>, and US<sub>3</sub> Molecules," *Inorg. Chem.* **2002**, *41*, 2811-2813.
576. X. F. Wang and L. Andrews, "Neon Matrix Infrared Spectrum of WH<sub>6</sub>: A Distorted Trigonal Prism Structure," *J. Am. Chem. Soc.* **2002**, *124*, 5636-5637.
577. B. Liang, L. Andrews, J. Li, and B. E. Bursten, "Experimental and Theoretical Studies of the Products of Laser-Ablated Thorium Atom Reactions with H<sub>2</sub>O in Excess Argon," *J. Am. Chem. Soc.* **2002**, *124*, 6723-6733.
578. L. Andrews and X. F. Wang, "Infrared Spectrum of the Novel Electron-Deficient BH<sub>4</sub> Radical in Solid Neon," *J. Am. Chem. Soc.* **2002**, *124*, 7280-7281.
579. X. F. Wang and L. Andrews, "Homoleptic Tetrahydrometalate Anions MH<sub>4</sub><sup>-</sup> (M = Sc, Y, La). Matrix Infrared Spectra and DFT Calculations," *J. Am. Chem. Soc.* **2002**, *124*, 7610-7613.
580. B. Liang, L. Andrews, J. Li, and B. E. Bursten, "Noble Gas-Actinide Compounds: Evidence for the Formation of Distinct CUO(Ar)<sub>4-n</sub>(Xe)<sub>n</sub> and CUO(Ar)<sub>4-n</sub>(Kr)<sub>n</sub> (n = 1, 2, 3, 4) Complexes," *J. Am. Chem. Soc.* **2002**, *124*, 9016-9017.
581. M. F. Zhou, N. Tsumori, Z. Li, K. Fan, L. Andrews, and Q. Xu, "OCBBCO: A Neutral Molecule with Some Boron-Boron Triple Bond Character," *J. Am. Chem. Soc.* **2002**, *124*, 12936-12937.
582. B. Liang and L. Andrews, "Matrix Infrared Spectra and Quasirelativistic DFT Studies of ThS and ThS<sub>2</sub>," *J. Phys. Chem. A* **2002**, *106*, 4038-4041.
583. B. Liang and L. Andrews, "Reactions of Laser-Ablated Osmium and Ruthenium Atoms with Carbon Dioxide: Matrix Infrared Spectra and Density Functional Calculations on OMCO, O<sub>2</sub>MCO, OMCO<sup>-</sup> (M = Os, Ru), O<sub>2</sub>Os(CO)<sub>2</sub>, and OCRu(O<sub>2</sub>)CO," *J. Phys. Chem. A* **2002**, 4042-4053.
584. X. F. Wang, L. Andrews, and G. P. Kushto, "Infrared Spectra of the Novel Ge<sub>2</sub>H<sub>2</sub> and Ge<sub>2</sub>H<sub>4</sub> Species and the Reactive GeH<sub>1,2,3</sub> Intermediates in Solid Neon, Deuterium and Argon," *J. Phys. Chem. A* **2002**, *106*, 5809-5816.
585. B. Liang and L. Andrews, "Infrared Spectra and Density Functional Theory Calculations of Group 4 Transition Metal Sulfides," *J. Phys. Chem. A* **2002**, *106*, 6295-6301.
586. X. F. Wang, L. Andrews, G. V. Chertihin, and P. F. Souter, "Infrared Spectra of the Novel Sn<sub>2</sub>H<sub>2</sub> Species and the Reactive SnH<sub>1,2,3</sub> and PbH<sub>1,2,3</sub> Intermediates in Solid Neon, Deuterium, and Argon," *J. Phys. Chem. A* **2002**, *106*, 6302-6308.

587. X. F. Wang and L. Andrews, "Neon Matrix Infrared Spectra and DFT Calculations of Tungsten Hydrides  $\text{WH}_x$  ( $x = 1-4, 6$ )," *J. Phys. Chem. A* **2002**, *106*, 6720-6729.
588. B. Liang and L. Andrews, "Infrared Spectra and Density Functional Theory Calculations of Group 6 Transition Metal Sulfides in Solid Argon," *J. Phys. Chem. A* **2002**, *106*, 6945-6951.
589. L. Andrews and X. F. Wang, "Infrared Spectra of the Novel  $\text{Si}_2\text{H}_2$  and  $\text{Si}_2\text{H}_4$  Species and the  $\text{SiH}_{1,2,3}$  Intermediates in Solid Neon, Argon, and Deuterium," *J. Phys. Chem. A* **2002**, *106*, 7696-7702.
590. R. Guo, K. Balasubramanian, X. F. Wang and L. Andrews, "Infrared Vibronic Absorption Spectrum and Spin-Orbit Calculations of the Upper Spin-Orbit Component of the  $\text{Au}_3$  Ground State," *J. Chem. Phys.* **2002**, *117*, 1614-1620.
591. B. Tremblay, L. Manceron, G. L. Gutsev, L. Andrews, and H. Partridge, III, "Experimental and Theoretical IR Spectra of  $\text{Co}_2\text{CO}$ ," *J. Chem. Phys.* **2002**, *117*, 8479-8485.
592. X. F. Wang, G. V. Chertihin, and L. Andrews, "Matrix Infrared Spectra and DFT Calculations of the Reactive  $\text{MH}_x$  ( $x = 1, 2, \text{ and } 3$ ),  $(\text{H}_2)\text{MH}_2$ ,  $\text{MH}_2^+$ , and  $\text{MH}_4^-$  ( $\text{M} = \text{Sc}, \text{Y}, \text{ and La}$ ) Species," *J. Phys. Chem. A* **2002**, *106*, 9213-9225.
593. B. Tremblay, G. Gutsev, L. Manceron, and L. Andrews, "Vibrational Spectrum and Structure of the  $\text{Fe}_2\text{CO}$  Molecule. An Infrared Matrix Isolation and Density Functional Theory Study," *J. Phys. Chem. A* **2002**, *106*, 10525-10531.
594. G. L. Gutsev, C. W. Bauschlicher, Jr. and L. Andrews, "Structure and Chemical Bonding of 3d-Metal Anions" pp.43-60 in *Theoretical Prospects of Negative Ions*, ed. J. Kalcher (Research Signpost, **2002**).
595. S. P. Willson and L. Andrews, "Matrix Isolation Infrared Spectroscopy" pp. 1342-1351 in *Handbook of Vibrational Spectroscopy*, Vol. 2, eds. J. M. Chalmers and P. R. Griffiths (John Wiley & Sons, LTD, London **2002**).
596. X. F. Wang and L. Andrews, "Side-Bonded  $\text{Pd}-\eta^2-(\text{C}_2\text{H}_2)_{1,2}$  and  $\text{Pd}_2-\eta^2-(\text{C}_2\text{H}_2)$  Complexes: Infrared Spectra and Density Functional Calculations," *J. Phys. Chem. A* **2003**, *107*, 337-345.
597. L. Andrews, M. F. Zhou, G. L. Gutsev, and X. F. Wang, "Reactions of Laser-Ablated Chromium Atoms, Cations, and Electrons with CO in Excess Argon and Neon: Infrared Spectra and Density Functional Calculations on Neutral and Charged Unsaturated Chromium Carbonyls," *J. Phys. Chem. A* **2003**, *107*, 561-569.
598. X. F. Wang and L. Andrews, "Chromium Hydrides and Dihydrogen Complexes in Solid Neon, Argon, and Hydrogen: Matrix Infrared Spectra and Quantum Chemical Calculations," *J. Phys. Chem. A* **2003**, *107*, 570-578.

599. L. Andrews, M. F. Zhou, and G. L. Gutsev, "Reactions of Laser-Ablated Mo and W Atoms, Cations and Electrons with CO in Excess Neon: Infrared Spectra and Density Functional Calculations on Neutral and Charged Unsaturated Metal Carbonyls," *J. Phys. Chem. A* **2003**, *107*, 990-999.
600. M. Zhou, N. Tsumori, L. Andrews, and Q. Xu, "Infrared Spectra of BCO, B(CO)<sub>2</sub>, and OCBBCO in Solid Argon," *J. Phys. Chem. A* **2003**, *107*, 2458-2463.
601. X. F. Wang and L. Andrews, "Matrix Infrared Spectra and Density Functional Theory Calculations of Manganese and Rhenium Hydrides," *J. Phys. Chem.* **2003**, *107*, 4081-4091.
602. L. Andrews and X. F. Wang, "The Infrared Spectrum of Al<sub>2</sub>H<sub>6</sub> in Solid Hydrogen," *Science* **2003**, *299*, 2049-2052.
603. X. F. Wang, P. F. Souter, and L. Andrews, "Infrared Spectra of Antimony and Bismuth Hydrides in Solid Matrixes," *J. Phys. Chem. A* **2003**, *107*, 4244-4249.
604. G. L. Gutsev, L. Andrews, and C. W. Bauschlicher, Jr., "Similarities and Differences in the Structure of 3d-Metal Monocarbides and Monoxides," *Theor. Chem. Acc.* **2003**, *109*, 298-308.
605. G. L. Gutsev, L. Andrews and C. B. Bauschlicher, Jr., "3d-metal Monocarbonyls MCO, MCO<sup>+</sup>, and MCO<sup>-</sup> (M = Sc to Cu): Comparative Bond Strengths and Catalytic Ability to Produce CO<sub>2</sub> in Reactions with CO," *Chem. Phys.* **2003**, *290*, 47-58.
606. L. Andrews, "Spectroscopy of Molecular Ions in Noble Gas Matrices," pp. 209-217 in *Encyclopedia of Mass Spectrometry, Vol 5*, ed. P. B. Armentrout, Elsevier, **2003**.
607. L. Andrews, B. Liang, J. Li, and B. E. Bursten "Noble Gas-Actinide Complexes of the CUO Molecule with Multiple Ar, Kr, and Xe Atoms in Noble-Gas Matrices," *J. Am. Chem. Soc.* **2003**, *125*, 3126-3139.
608. X. F. Wang and L. Andrews, "Infrared Spectra of Group 14 Hydrides in Solid Hydrogen: Experimental Observation of PbH<sub>4</sub>, Pb<sub>2</sub>H<sub>2</sub> and Pb<sub>2</sub>H<sub>4</sub>," *J. Am. Chem. Soc.* **2003**, *125*, 6581-6587.
609. X. F. Wang, L. Andrews, S. Tam, M. E. DeRose and M. E. Fajardo, "Infrared Spectra of Aluminum Hydrides in Solid Hydrogen: Al<sub>2</sub>H<sub>4</sub> and Al<sub>2</sub>H<sub>6</sub>," *J. Am. Chem. Soc.* **2003**, *125*, 9218-9228.
610. B. Liang, L. Andrews, J. Li, and B. E. Bursten, "Bonding of Multiple Noble-Gas Atoms to CUO in Solid Neon: CUO(Ng)<sub>n</sub> (Ng = Ar, Kr, Xe; n = 1, 2, 3, 4) Complexes and the Singlet-Triplet Crossover Point," *Chem. Eur. J.* **2003**, *9*, 4781-4788.

611. M. Zhou, N. Tsumori, Q. Xu, G. P. Kushto, and L. Andrews, "Reactions of B Atoms and Clusters with NO: Experimental and Theoretical Characterization of Novel Molecules Containing B, N, and O," *J. Am. Chem. Soc.* **2003**, *125*, 11371-11378.
612. L. Andrews and X. F. Wang, "Infrared Spectra and Structures of the Stable  $\text{CuH}_2^-$ ,  $\text{AgH}_2^-$ ,  $\text{AuH}_2^-$ , and  $\text{AuH}_4^-$  Anions and the  $\text{AuH}_2$  Molecule," *J. Am. Chem. Soc.* **2003**, *125*, 11751-11760.
613. X. F. Wang, L. Andrews, L. Manceron, and C. Marsden, "Infrared Spectra and DFT Calculations for the Coinage Metal Hydrides  $\text{MH}$ ,  $(\text{H}_2)\text{MH}$ ,  $\text{MH}_2$ ,  $\text{M}_2\text{H}$ ,  $\text{M}_2\text{H}^-$ , and  $(\text{H}_2)\text{CuHCu}$  in Solid Argon, Neon, and Hydrogen," *J. Phys. Chem. A* **2003**, *107*, 8492-8505.
614. G. L. Gutsev, C. W. Bauschlicher, Jr., and L. Andrews, "Structure of Neutral and Charged  $\text{Fe}_n\text{CO}$  Clusters ( $n = 1-6$ ) and Energetics of the  $\text{Fe}_n\text{CO} + \text{CO} \rightarrow \text{Fe}_n\text{C} + \text{CO}_2$  Reaction," *J. Chem. Phys.* **2003**, *119*, 3681-3690.
615. X. F. Wang and L. Andrews, "Gold is Noble but Gold Hydride Anions are Stable," *Angew Chem. Int. Ed.* **2003**, *42*, 5201-5206.
616. X. F. Wang and L. Andrews, "Infrared Spectra of Gallium Hydrides in Solid Hydrogen:  $\text{GaH}_{1,2,3}$ ,  $\text{Ga}_2\text{H}_{2,4,6}$ , and the  $\text{GaH}_{2,4}^-$  Anions," *J. Phys. Chem. A* **2003**, *107*, 11371-11379.
617. L. Andrews, "Matrix Infrared Spectra and Density Functional Calculations of Transition Metal Hydrides and Dihydrogen Complexes," *Chem. Soc. Rev.* **2004**, *33*, 123-132.
618. L. Andrews, B. Liang, J. Li, and B. E. Bursten, "Noble Gas-Uranium Coordination and Intersystem Crossing for the  $\text{CUO}(\text{Ne})_x(\text{Ng})_n$  ( $\text{Ng} = \text{Ar, Kr, Xe}$ ) Complexes in Solid Neon," *New. J. Chem.* **2004**, *28*, 289-294.
619. X. F. Wang and L. Andrews, "Identification of the  $(\text{H}^-)(\text{H}_2)_{12}$  Hydride Anion Cluster in Solid Hydrogen," *J. Phys. Chem. A* **2004**, *108*, 1103-1106.
620. L. Andrews, X. F. Wang, L. Manceron, and K. Balasubramanian, "The Gold Dihydride Molecule,  $\text{AuH}_2$ : Calculations of Structure, Stability and Frequencies, and the Infrared Spectrum in Solid Hydrogen," *J. Phys. Chem. A* **2004**, *108*, 2936-2940.
621. L. Andrews and X. F. Wang, "Infrared Spectra of Indium Hydrides in Solid Hydrogen and of Solid Indane," *Angew. Chem. Int. Ed.* **2004**, *43*, 1706-1709. *Angew. Chem.* **2004**, *116*, 1738-1741.
622. J. Li, B. E. Bursten, L. Andrews, and C. J. Marsden, "On the Electronic Structure of Molecular  $\text{UO}_2$  in the Presence of Ar Atoms: Evidence for Direct U-Ar Bonding," *J. Am. Chem. Soc.* **2004**, *126*, 3424-3425.
623. X. F. Wang, L. Andrews, J. Li and B. E. Bursten, "Significant Interactions Between Uranium and Noble-Gas Atoms: Coordination of the  $\text{UO}_2^+$  Cation by Ne, Ar, Kr, and Xe

- Atoms," *Angew. Chem. Int. Ed.* **2004**, *43*, 2554-2557. *Angew. Chem.* **2004**, *116*, 2608-2611.
624. B. Liang L. Andrews, J. Li, and B. E. Bursten, "On the Noble-Gas-Induced Intersystem Crossing for the CUO Molecule: Experimental and Theoretical Investigations of CUO(Ng)<sub>n</sub> (Ng = Ar, Kr, Xe; n = 1, 2, 3, 4) Complexes in Solid Neon," *Inorg. Chem.* **2004**, *43*, 882-894.
625. X. F. Wang and L. Andrews, "Infrared Spectra of Thallium Hydrides in Solid Neon, Hydrogen, and Argon," *J. Phys. Chem. A* **2004**, *108*, 3396-3402.
626. L. Andrews and X. F. Wang, "Infrared Spectra of H<sub>2</sub> Molecules Near H Atoms Trapped in Solid H<sub>2</sub>," *J. Phys. Chem. A* **2004**, *108*, 3879-3883.
627. H.-G. Cho and L. Andrews, "Hydrogen Elimination from Ethylene by Laser-Ablated Zr Atoms: An Infrared Spectroscopic Investigation of the Reaction Intermediates in a Solid Argon Matrix," *J. Phys. Chem. A* **2004**, *108*, 3965-3972.
628. L. Andrews and X. F. Wang, "Infrared Spectra of Dialanes in Solid Hydrogen," *J. Phys. Chem. A* **2004**, *108*, 4202-4210.
629. X. F. Wang and L. Andrews, "Infrared Spectra of Indium Hydrides in Solid Hydrogen and Neon," *J. Phys. Chem. A* **2004**, *108*, 4440-4448.
630. X. F. Wang and L. Andrews, "Infrared Spectra and Density Functional Calculations for Three Pt-C<sub>2</sub>H<sub>2</sub> Reaction Product Isomers: PtCCH<sub>2</sub>, HPtCCH, and Pt- $\eta^2$ -(C<sub>2</sub>H<sub>2</sub>)," *J. Phys. Chem. A* **2004**, *108*, 4838-4845.
631. X. F. Wang, B. Wolfe, and L. Andrews, "Emission Spectra of Group 13 Metal Atoms and Indium Hydrides in Solid H<sub>2</sub> and D<sub>2</sub>," *J. Phys. Chem. A* **2004**, *108*, 5169-5174.
632. H.-G. Cho and L. Andrews, "Photoreversible Hydrogen Migration System in a Solid Argon Matrix Formed by the Reaction of Methyl Fluoride with Laser-Ablated Titanium Atoms," *J. Phys. Chem. A* **2004**, *108*, 6294-6301.
633. L. Andrews and X. F. Wang, "A Simple Ortho-Para Hydrogen and Para-Ortho Deuterium Converter for Matrix Isolation Spectroscopy," *Rev. Sci. Instrum.* **2004**, *75*, 3039-3044.
634. H.-G. Cho and L. Andrews, "Preparation of CH<sub>3</sub>TiF and (CH<sub>3</sub>)<sub>2</sub>TiF<sub>2</sub> from the Reaction of CH<sub>3</sub>F with Laser-Ablated Ti Atoms," *Inorg. Chem.* **2004**, *43*, 5253-5257.
635. H.-G. Cho and L. Andrews, "Reactions of Laser-Ablated Palladium and Platinum Atoms with Ethylene: An Infrared Study of the Palladium Complex and Platinum Insertion Product Isolated in Solid Argon," *J. Phys. Chem. A* **2004**, *108*, 6272-6278.
636. H.-G. Cho and L. Andrews, "Persistent Photo-Reversible Transition-Metal Methylidene System Generated from Reaction of Methyl Fluoride with Laser-Ablated Zirconium Atoms and Isolated in a Solid Argon Matrix," *J. Am. Chem. Soc.* **2004**, *126*, 10485-10492.



637. L. Andrews and X. F. Wang, "A Discharge Investigation of Hydrogen and Deuterium Atom Formation, and Parahydrogen and Orthodeuterium Reconversion," *J. Chem. Phys.* **2004**, *121*, 4724-4729.
638. H.-G. Cho and L. Andrews, "Formation of a Simple Hafnium Methylidene Complex by Reaction of Methyl Fluoride with Laser-Ablated Hafnium Atoms," *Organometallics* **2004**, *23*, 4357-4361.
639. X. F. Wang and L. Andrews, "Solid Mercury Dihydride: Mercuriphilic Bonding in Molecular HgH<sub>2</sub> Polymers," *Inorg. Chem.* **2004**, *43*, 7146-7150.
640. H.-G. Cho and L. Andrews, "Infrared Spectroscopic Studies of Mono-, Di-, and Trihydrido C-H Insertion Complexes Formed in Reaction of Ethylene with Laser-Ablated Hafnium Atoms and Isolated in a Solid Argon Matrix," *J. Phys. Chem. A* **2004**, *108*, 10441-10447.
641. X. F. Wang and L. Andrews, "Infrared Spectra of Zn and Cd Hydride Molecules and Solids," *J. Phys. Chem. A* **2004**, *108*, 11006-11013.
642. X. F. Wang and L. Andrews, "Metal Dihydride (MH<sub>2</sub>) and Dimer (M<sub>2</sub>H<sub>4</sub>) Structures in Solid Argon, Neon, and Hydrogen (M = Ca, Sr, and Ba): Infrared Spectra and Theoretical Calculations," *J. Phys. Chem. A* **2004**, *108*, 11500-11510.
643. X. F. Wang and L. Andrews, "Infrared Spectra of Magnesium Hydride Molecules, Complexes, and Solid Magnesium Dihydride," *J. Phys. Chem. A* **2004**, *108*, 11511-11520.
644. L. Andrews and X. F. Wang, "Infrared Spectra of the Group 2 Metal Dihydroxide Molecules," *Inorg. Chem.* **2005**, *44*, 11-13.
645. X. F. Wang and L. Andrews, "Infrared Spectrum of Hg(OH)<sub>2</sub> in Solid Neon and Argon," *Inorg. Chem.* **2005**, *44*, 108-113.
646. L. Andrews, H.-G. Cho, and X. F. Wang, "CH<sub>2</sub>=ZrH<sub>2</sub>: The Simplest Carbene Complex, Agostic Bonding, and C-H Activation of CH<sub>4</sub> to Form (CH<sub>3</sub>)<sub>2</sub>ZrH<sub>2</sub>," *Angew. Chem. Int. Ed.* **2005**, *44*, 113-116. *Angew. Chem.* **2005**, *117*, 115-118.
647. H.-G. Cho, X. F. Wang, and L. Andrews, "The C-H Activation of Methane by Laser-Ablated Zirconium Atoms: CH<sub>2</sub>=ZrH<sub>2</sub>, the Simplest Carbene Hydride Complex, Agostic Bonding, and (CH<sub>3</sub>)<sub>2</sub>ZrH<sub>2</sub>," *J. Am. Chem. Soc.* **2005**, *127*, 465-473.
648. J. T. Lyon and L. Andrews, "Infrared Spectrum of the Au-C<sub>60</sub> Complex," *ChemPhysChem* **2005**, *6*, 229-232.
649. X. F. Wang and L. Andrews, "Mercury Dihydride Forms a Covalent Molecular Solid," *Phys. Chem. Chem. Phys.* **2005**, *7*, 750-759.

650. X. F. Wang and L. Andrews, "One-Dimensional BeH<sub>2</sub> Polymers: Infrared Spectra and Theoretical Calculations," *Inorg. Chem.* **2005**, *44*, 610-614.
651. H.-G. Cho and L. Andrews, "Formation of CH<sub>3</sub>TiX, CH<sub>2</sub>=TiHX, and (CH<sub>3</sub>)<sub>2</sub>TiX<sub>2</sub> by Reaction of Methyl Chloride and Bromide with Laser-Ablated Titanium Atoms: Photoreversible  $\alpha$ -Hydrogen Migration," *Inorg. Chem.* **2005**, *44*, 979-988.
652. B. Liang, R. D. Hunt, G. P. Kushto, L. Andrews, J. Li, and B. E. Bursten, "Reactions of Laser-Ablated Uranium Atoms with H<sub>2</sub>O in Excess Argon: A Matrix Infrared and Relativistic DFT Investigation of Uranium Oxyhydrides," *Inorg. Chem.* **2005**, *44*, 2159-2168.
653. J. T. Lyon and L. Andrews, "V, Nb, and Ta Complexes with Benzene in Solid Argon: An Infrared Spectroscopic and Density Functional Study," *J. Phys. Chem. A* **2005**, *109*, 431-440.
654. X. F. Wang and L. Andrews, "Infrared Spectra and Electronic Structure Calculations for the Group 2 Metal M(OH)<sub>2</sub> Dihydroxide Molecules," *J. Phys. Chem. A* **2005**, *109*, 2782-2792.
655. X. F. Wang and L. Andrews, "Zinc and Cadmium Dihydroxide Molecules: Matrix Infrared Spectra and Theoretical Calculations," *J. Phys. Chem. A* **2005**, *109*, 3849-3857.
656. H.-G. Cho and L. Andrews, "[CH<sub>3</sub>-MoF], [CH<sub>2</sub>=MoHF], and [CH $\equiv$ MoH<sub>2</sub>F] Formed by Reaction of Laser-Ablated Molybdenum Atoms with Methyl Fluoride: Persistent Photoreversible Interconversion through  $\alpha$ -Hydrogen Migration and Agostic Interaction," *Chem. Eur. J.* **2005**, *11*, 5017-5023.
657. H.-G. Cho and L. Andrews, "Infrared Spectra of CH<sub>3</sub>-MoH, CH<sub>2</sub>=MoH<sub>2</sub>, and CH $\equiv$ MoH<sub>3</sub> Formed by Activation of CH<sub>4</sub> by Mo Atoms," *J. Am. Chem. Soc.* **2005**, *127*, 8226-8231.
658. H.-G. Cho, X. F. Wang, and L. Andrews, "Reactions of Methane with Hafnium Atoms: CH<sub>2</sub>=HfH<sub>2</sub>, Agostic Bonding and (CH<sub>3</sub>)<sub>2</sub>HfH<sub>2</sub>," *Organometallics* **2005**, *24*, 2854-2861.
659. L. Andrews, H.-G. Cho, and X. F. Wang, "Reactions of Methane with Titanium Atoms: CH<sub>3</sub>TiH, CH<sub>2</sub>=TiH<sub>2</sub>, Agostic Bonding, and (CH<sub>3</sub>)<sub>2</sub>TiH<sub>2</sub>," *Inorg. Chem.* **2005**, *44*, 4834-4842.
660. X. F. Wang and L. Andrews, "Infrared Spectrum and Structure of the Gold Dihydroxide Molecule," *Chem. Comm.* **2005**, 4001-4003.
661. L. Andrews and H.-G. Cho, "Infrared Spectrum and Structure of CH<sub>2</sub>=ThH<sub>2</sub>," *J. Phys. Chem. A* **2005**, *109*, 6796-6798.
662. X. F. Wang and L. Andrews, "Infrared Spectrum and Structure of the Hf(OH)<sub>4</sub> Molecule," *Inorg. Chem.* **2005**, *44*, 7189-7193.

663. H.-G. Cho and L. Andrews, "Infrared Spectra of the  $\text{CH}_3\text{-CrF}$ ,  $\text{CH}_2\text{=WHF}$ , and  $\text{CH}\equiv\text{WH}_2\text{F}$  Molecules: Reversible Photochemical Interconversion by  $\alpha$ -Hydrogen Transfer," *Organometallics* **2005**, *24*, 5678-5685.
664. A. B. Baker, C. Samet, J. T. Lyon, and L. Andrews, "Pentachlorocyclopropane/Base Complexes: Matrix Isolation Infrared Spectroscopic and Density Functional Study of C-H...N Hydrogen Bonds," *J. Phys. Chem. A* **2005**, *109*, 8280-8289.
665. X. F. Wang and L. Andrews, "Infrared Spectra of  $\text{M(OH)}_{1,2,3}$  (M = Pb, Sn) in Solid Argon," *J. Phys. Chem. A* **2005**, *109*, 9013-9020
666. J. T. Lyon and L. Andrews, "Formation and Characterization of Thorium Methylidene  $\text{CH}_2\text{=ThHX}$  Complexes," *Inorg. Chem.* **2005**, *44*, 8610-8616.
667. X. F. Wang and L. Andrews, "Matrix Infrared Spectra and Density Functional Theory Calculations of Molybdenum Hydrides," *J. Phys. Chem. A* **2005**, *109*, 9021-9027.
668. L. Krim, X. F. Wang, L. Manceron, and L. Andrews, "Absorption Spectra of Ground-State and Low-Lying Electronic States of Copper Nitrosyl: A Rare Gas Matrix Isolation Study," *J. Phys. Chem. A* **2005**, *109*, 10264-10272.
669. X. F. Wang and L. Andrews, "Infrared Spectra and Structures for Group 4 Dihydroxide and Tetrahydroxide Molecules," *J. Phys. Chem. A* **2005**, *109*, 10689-10701.
670. X. F. Wang and L. Andrews, "Infrared Spectra and Structures of the Coinage Metal Dihydroxide Molecules," *Inorg. Chem.* **2005**, *44*, 9076-9083.
671. X. F. Wang and L. Andrews, "Infrared Spectra and Structures of the  $\text{Th(OH)}_2$  and  $\text{Th(OH)}_4$  Molecules," *Phys. Chem. Chem. Phys.* **2005**, *7*, 3834 - 3838.
672. H.-G. Cho, L. Andrews, and C. Marsden, "Infrared Spectra of  $\text{CH}_3\text{-CrH}$ ,  $\text{CH}_3\text{-WH}$ ,  $\text{CH}_2\text{=WH}_2$ , and  $\text{CH}\equiv\text{WH}_3$  Formed by Activation of  $\text{CH}_4$  with Cr and W Atoms," *Inorg. Chem.* **2005**, *44*, 7634-7643.
673. H.-G. Cho and L. Andrews, "Infrared Spectra of  $\text{CH}_3\text{-NbF}$ ,  $\text{CH}_2\text{=NbHF}$ , and  $\text{CH}\equiv\text{NbH}_2\text{F}^-$  Formed by Reaction of Methyl Fluoride with Laser-Ablated Niobium Atoms," *Organometallics* **2006**, *25*, 477-484.
674. X. F. Wang and L. Andrews, "Infrared Spectra and Density Functional Calculations for the  $\text{Sc(OH)}_{2,3}$  and  $\text{HOscO}$  Molecules and the  $\text{Sc(OH)}_2^+$  Cation in Solid Argon," *J. Phys. Chem. A* **2006**, *110*, 1850-1858.
675. J. T. Lyon and L. Andrews, "Formation and Characterization of the Uranium Methylidene Complexes  $\text{CH}_2\text{=UHX}$  (X = F, Cl, and Br)," *Inorg. Chem.* **2006**, *45*, 1847-1852.

676. H.-G. Cho and L. Andrews, "Methane Activation by Laser-Ablated V, Nb, and Ta Atoms: Formation of  $\text{CH}_3\text{-MH}$ ,  $\text{CH}_2=\text{MH}_2$ ,  $\text{CH}\equiv\text{MH}_3^-$ , and  $(\text{CH}_3)_2\text{MH}_2$ ," *J. Phys. Chem. A* **2006**, *110*, 3886-3902.
677. J. T. Lyon and L. Andrews, "Formation of  $\text{CH}_2=\text{TiF}_2$  by C-F Activation and  $\alpha$ -F Transfer," *Organometallics* **2006**, *25*, 1341-1343.
678. X. F. Wang and L. Andrews, "Infrared Spectra and Density Functional Calculations for  $\text{M}(\text{OH})_{2,3}$  and HOMO Molecules and  $\text{M}(\text{OH})_2^+$  Cations ( $\text{M} = \text{Y, La}$ )," *J. Phys. Chem. A* **2006**, *110*, 4157-4168.
679. X. F. Wang, L. Andrews, and J. Li, "Experimental and Theoretical Investigations of IR Spectra and Electronic Structures of the  $\text{U}(\text{OH})_2$ ,  $\text{UO}_2(\text{OH})$ , and  $\text{UO}_2(\text{OH})_2$  Molecules," *Inorg. Chem.* **2006**, *45*, 4157-4166.
680. J. T. Lyon and L. Andrews. "Electron Deficient Carbon-Titanium Triple Bonds: Formation of Triplet  $\text{XC}\equiv\text{TiX}_3$  Methylidyne Complexes," *Inorg. Chem.* **2006**, *45*, 9858-9863.
681. L. Andrews and H.-G. Cho, "Matrix Preparation and Spectroscopic and Theoretical Investigations of Simple Methylidene and Methylidyne Complexes of Group 4, 5, and 6 Transition Metals," *Organometallics* **2006**, *25*, 4040-4053.
682. J.T. Lyon and L. Andrews, "Group 4 Transition Metal-Benzene Adducts: Carbon Ring Deformation upon Complexation," *J. Phys. Chem A* **2006**, *110*, 7806-7815.
683. X. F. Wang and L. Andrews, "Contrasting Products in the Reactions of Cr, Mo, and W Atoms with  $\text{H}_2\text{O}_2$ : Argon Matrix Infrared Spectra and Theoretical Calculations," *J. Phys. Chem. A* **2006**, *110*, 10409-10418.
684. X. F. Wang and L. Andrews, "Infrared Spectra of  $\text{M}(\text{OH})_{1,2,3}$  ( $\text{M} = \text{Mn, Fe, Co, Ni}$ ) Molecules in Solid Argon and the Character of First Row Transition Metal Hydroxide Bonding," *J. Phys. Chem. A* **2006**, *110*, 10035-10046.
685. H.-G. Cho and L. Andrews, "Infrared Spectra of the  $\text{CH}_3\text{-MX}$ ,  $\text{CH}_2=\text{MHX}$ , and  $\text{CH}\equiv\text{MH}_2\text{X}^-$  Complexes Formed by Reaction of Methyl Halides with Laser-Ablated Group 5 Metal Atoms," *J. Phys. Chem. A* **2006**, *110*, 10063-10077.
686. A.B. Baker and L. Andrews, "Reactions of Group 3 Transition Metal Atoms with  $\text{CS}_2$  and  $\text{OCS}$ : Matrix Isolation Infrared Spectra and Density-Functional Calculations of  $\text{MMCS}$ ,  $\text{SM}-(\eta^2\text{-CS})$ ,  $\text{SMCO}$ , and  $\text{SM}-(\eta^2\text{-CO})$  in Solid Argon," *J. Phys. Chem. A* **2006**, *110*, 10419-10426.
687. A.B. Baker and L. Andrews, "Group 4 Transition-Metal Atom Reactions with  $\text{CS}_2$  and  $\text{OCS}$ : Infrared Spectra and Density Functional Calculations of  $\text{SMCS}$ ,  $\text{SM}-(\eta^2\text{-CS})$ ,  $\text{SMCO}$ , and  $\text{OMCS}$  in Solid Argon," *J. Phys. Chem. A* **2006**, *110*, 12785-12792.

688. H.-G. Cho and L. Andrews, "Infrared Spectra and Density Functional Calculations of  $\text{CH}_2=\text{MHX}$  and  $\text{CH}\equiv\text{MH}_2\text{X}$  Complexes Prepared in Reactions of Methyl Halides with Mo and W Atoms," *J. Phys. Chem. A* **2006**, *110*, 13151-13162.
689. L. Andrews, G.P. Kushto, and C.J. Marsden, "Reactions of Th and U Atoms with  $\text{C}_2\text{H}_2$ : Infrared Spectra and Relativistic Calculations of the Metallacyclopentene, Actinide Insertion, and Ethynyl Products," *Chem. Eur. J.* **2006**, *12*, 8324-8335.
690. H.-G. Cho, T.-H. Kim, and L. Andrews, "Periodic Trends in the Agostic Interaction in Zirconium and Hafnium Methylidene Hydride Halide Complexes," *Chem. Asian J.* **2006**, *1*, 404-416.
691. H.-G. Cho and L. Andrews, "Methane Activation by Laser-Ablated Group 3 Metal Atoms: Infrared Spectra and Structures of the  $\text{CH}_3\text{-MH}$  and  $\text{CH}_2=\text{MH}_2$  Complexes," *Organometallics* **2007**, *26*, 633-643.
692. J.T. Lyon and L. Andrews, "An Infrared Spectroscopic and Theoretical Study of Group 4 Transition Metal  $\text{CH}_2=\text{MC1}_2$  and  $\text{HC}\equiv\text{MC1}_3$  Complexes," *Organometallics* **2007**, *26*, 332-339.
693. C. J. Dove, A. M. Rijke, X. F. Wang, and L. Andrews, "Infrared Analysis of Contour Feathers. The Conservation of Body Heat and Radiation in Birds," *J. Thermal Biology*, **2007**, *32*, 42-46.
694. X. F. Wang and L. Andrews, "Infrared Spectroscopic Observation of the Group 13 Metal Hydroxides,  $\text{M}(\text{OH})_{1,2,3}$ , (M=Al, Ga, In, and Tl) and  $\text{HAL}(\text{OH})_2$ ," *J. Phys. Chem. A* **2007**, *111*, 1860-1868.
695. X. F. Wang and L. Andrews, "The Activation of Hydrogen by Li Atoms to Form  $(\text{LiH})_2$ ," *Angew. Chem Int. Ed.* **2007**, *46*, 2602-2606.
696. H.-G. Cho and L. Andrews, "Infrared Spectra of the  $\text{CH}_3\text{-MX}$  and  $\text{CH}_2\text{-MHX}$  Formed by Reactions of Laser-Ablated Group 3 Metal Atoms with Methyl Halides," *J. Phys. Chem. A* **2007**, *111*, 2480-2491.
697. J. T. Lyon and L. Andrews, "Group 4 Transition Metal  $\text{CH}_2=\text{MF}_2$ ,  $\text{CHF}=\text{MF}_2$ , and  $\text{HC}\equiv\text{MF}_3$  Complexes Formed by C-F Activation and  $\alpha$ -Fluorine Transfer," *Inorg. Chem.* **2007**, *46*, 4799-4808.
698. X. F. Wang, L. Andrews, and C. J. Marsden, "Infrared Spectrum and Structure of Thorimine,  $[\text{HN}=\text{ThH}_2]$ ," *Chem. Eur. J.* **2007**, *13*, 5601-5606.
699. J. T. Lyon and L. Andrews, "Titanium, Zirconium, and Hafnium Metal Atom Reactions with  $\text{CF}_4$ ,  $\text{CCl}_4$ , and  $\text{CF}_2\text{Cl}_2$ : A Matrix Isolation Spectroscopic and DFT Investigation of Triplet  $\text{XC}\equiv\text{MX}_3$  Complexes," *Organometallics* **2007**, *26*, 2519-2527.

700. J. T. Lyon, L. Andrews, P.-Å. Malmqvist, B. O. Roos, T. Yang, and B. E. Bursten, "Infrared Spectrum and Bonding in Uranium Methylidene Dihydride,  $\text{CH}_2=\text{UH}_2$ ," *Inorg. Chem.* **2007**, *46*, 4917-4925.
701. H.-G. Cho and L. Andrews, "Methane and Methyl Halide Activation by Sc Atoms: Infrared Spectra and DFT Calculations for the  $\text{CH}_3\text{-ScX}$  and  $\text{CH}_2\text{-ScHX}$  Complexes," *Inorg. Chimica Acta* **2007**, *36X*, 551-559.
702. X. F. Wang and L. Andrews, "Infrared Spectra and Theoretical Calculations of "Lithium Hydride Clusters in Solid Hydrogen, Neon and Argon," *J. Phys. Chem. A* **2007**, *111*, 6008-6019.
703. H.-G. Cho and L. Andrews, "Matrix Infrared Spectroscopic Studies of the  $\text{MH-C}_2\text{H}_3$  and  $\text{MH}_2\text{-C}_2\text{H}_2$  Intermediates in Reactions of Ethylene with Laser-Ablated Group 5 Metal Atoms," *J. Phys. Chem. A* **2007**, *111*, 5201-5210.
704. J. T. Lyon and L. Andrews, "Group 4 Metal Atom Reactions with  $\text{CF}_3\text{Cl}$ ,  $\text{CFCl}_3$ ,  $\text{CF}_3\text{Br}$ , and  $\text{CF}_3\text{I}$ : A Matrix Infrared Spectroscopic and DFT Investigation of Competitive  $\alpha$ -Halogen Transfer to Form Triplet  $\text{XC}\equiv\text{MX}_3$  Complexes," *Organometallics* **2007**, *26*, 4152-4159.
705. B. O. Roos, R. H. Lindh, H.-G. Cho, and L. Andrews, "On the Agostic Interaction in the Methylidene Metal Dihydride Complexes  $\text{H}_2\text{MCH}_2$  ( $\text{M}=\text{Y}$ ,  $\text{Zr}$ ,  $\text{Nb}$ ,  $\text{Mo}$ ,  $\text{Ru}$ ,  $\text{Th}$ , or  $\text{U}$ )," *J. Phys. Chem. A* **2007**, *111*, 6420-6424.
706. J. Raab, R. H. Lindh, X. F. Wang, L. Andrews, and L. Gagliardi, "A Combined Experimental and Theoretical Study of some Uranium Polyhydrides Shows that Sixteen Hydrogen Atoms Can Bind a Uranium Atom," *J. Phys. Chem. A* **2007**, *111*, 6383-6387.
707. X. F. Wang and L. Andrews, "Sodium Hydride Clusters in Solid Hydrogen and Neon: Infrared Spectra and Theoretical Calculations," *J. Phys. Chem. A* **2007**, *111*, 7098-7104.
708. H.-G. Cho and L. Andrews, "Formation of  $\text{HC}\equiv\text{ReH}_3$  in Methane Activation by Re Atoms: Observation of the Elusive Methylidyne C-H Stretching Absorption," *Organometallics* **2007**, *26*, 4098-4101.
709. J. T. Lyon, H.-G. Cho, L. Andrews, H.-S. Hu, and J. Li, "Infrared and DFT Investigations of the  $\text{XC}\equiv\text{ReX}_3$  and  $\text{HC}\equiv\text{ReX}_3$  Complexes: Jahn-Teller Distortion and the Methylidyne C-H(D) Stretching Modes," *Inorg. Chem.* **2007**, *46*, 8728-8738.
710. X. F. Wang and L. Andrews, "Infrared Spectra and Theoretical Calculations of  $\text{KH}$  and  $(\text{KH})_2$ ," *J. Phys. Chem. A* **2007**, *111*, 12260-12265.
711. J. T. Lyon, H.-G. Cho, and L. Andrews, "Methylidyne Molecules  $\text{XC}\equiv\text{MX}_3$  ( $\text{M} = \text{Cr}$ ,  $\text{Mo}$ ,  $\text{W}$ ;  $\text{X} = \text{H}$ ,  $\text{F}$ ,  $\text{Cl}$ ) Diagnostic C-H and C-X Stretching Absorptions and Methylidene  $\text{CH}_2=\text{MX}_2$  Analogs," *Organometallics* **2007**, *26*, 6373-6387.

712. X. F. Wang, L. Andrews, S. Riedel, and M. Kaupp, "Mercury is a Transition Metal: The First Experimental Evidence for  $\text{HgF}_4$ ," *Angew. Chem. Intl. Ed.* **2007**, *46*, 8371-8375.
713. J. Li, H.-S. Hu, J. T. Lyon, and L. Andrews, "Chirality, Agosticity, and Pyramidity in Actinide Methylidene Complexes," *Angew. Chem.* **2007**, *46*, 9045-9049.
714. J. T. Lyon, L. Andrews, H.-S. Hu, and J. Li, "Formation of Unprecedented Actinide $\equiv$ Carbon Triple Bonds in Uranium Methylidyne Molecules," *Proc. Nat'l. Acad. Sci.* **2007**, *104*, 18919-18924.
715. Y. Gong, M. Zhou, and L. Andrews "Formation and Characterization of the Photochemically Interconvertible Side-On and End-On Bonded Dioxygen-Iron Dioxide Complexes in Solid Argon" *J. Phys. Chem. A* **2007**, *111*, 12001-12006.
716. J. T. Lyon, L. Andrews, H.-S. Hu, and J. Li, "Infrared Spectra and Electronic Structures of Agostic Uranium Methylidene Molecules," *Inorg. Chem.* **2008**, *47*, 1435-1442.
717. H.-G. Cho and L. Andrews, "Infrared Spectra of Methylidyne Formed in Reactions of Re Atoms with Methane, Methyl Halides, Methylene Halides, and Ethane: Methylidyne C-H Stretching Absorptions, Bond Lengths, and s Character" *Inorg. Chem.* **2008**, *47*, 1653-1662.
718. H.-G. Cho and L. Andrews, "C-H Activation of Ethane by Group 4 Metal Atoms: Observation and Characterization of the  $\text{MH-CH}_2\text{CH}_3$ ,  $\text{MH}_2\text{-(CH}_2)_2$ , and  $\text{MH}_3\text{-CH=CH}_2$  Complexes," *J. Phys. Chem. A* **2008**, *112*, 1519-1525.
719. X. F. Wang, L. Andrews, and L. Gagliardi, "Infrared Spectra of  $\text{ThH}_2$ ,  $\text{ThH}_4$ , and the Hydride Bridging  $\text{ThH}_4(\text{H}_2)_x$  Complexes in Solid Argon, Neon, and Hydrogen," *J. Phys. Chem. A* **2008**, *112*, 1754-1761.
720. J. T. Lyon and L. Andrews, "Reactions of Thorium Atoms with Polyhalomethanes: Infrared Spectra of the  $\text{CH}_2=\text{ThX}_2$ ,  $\text{HC}\div\text{ThX}_3$ , and  $\text{XC}\div\text{ThX}_3$  Molecules," *Eur. J. Inorg. Chem.* **2008**, 1047-1058.
721. X. F. Wang, L. Andrews, I. Infante, and L. Gagliardi, "Infrared Spectra of the  $\text{WH}_4(\text{H}_2)_4$  Complex in Solid Hydrogen," *J. Am. Chem. Soc.* **2008**, *130*, 1972-1978.
722. H.-G. Cho and L. Andrews, "Methylidyne Complexes Prepared by Reactions of Laser-Ablated Os Atoms with Methane, Methyl Halides, and Ethane: Observation of the C-H and Os-H Stretching Absorptions," *Organometallics* **2008**, *27*, 1786-1796.
723. X. F. Wang and L. Andrews, "Silylidyne  $\text{HSi}\equiv\text{MoH}_3$ ,  $\text{HSi}\equiv\text{WH}_3$  and Silyl Metal Hydride  $\text{SiH}_3\text{---CrH}$  Products in Silane Reactions," *J. Am. Chem. Soc.*, **2008**, *130*, 6766-6773.
724. H.-G. Cho and L. Andrews, "Infrared Spectra of Insertion, Methylidene, and Methylidyne Complexes in Reactions of Laser-Ablated Ruthenium Atoms with Halomethanes and Methane," *Eur. J. Inorg. Chem.* **2008**, 2537-2549.

725. L. Andrews, X. F. Wang, R. Lindh, B.O. Roos, and C. J. Marsden, "Simple  $N\equiv UF_3$  and  $P\equiv UF_3$  Molecules with Triple Bonds to Uranium," *Angew. Chem.* **2008**, *47*, 5446-5450. *Angew. Chem. Intl. Ed.* **2008**, *47*, 5366-5370.
726. H.-G. Cho, G. P. Kushto, L. Andrews, and C. W. Bauschlicher, Jr., "Infrared Spectra of  $HC\equiv C-MH$  and  $M-\eta^2-(C_2H_2)$  from Reactions of Laser-Ablated Group 4 Transition-Metal Atoms with Acetylene," *J. Phys. Chem. A* **2008**, *112*, 6295-6304.
727. H.-G. Cho, J. T. Lyon, and L. Andrews, "Reactions of Actinide Metal Atoms with Ethane: Computation and Observation of New Th and U Ethylidene Dihydride, Metallacyclopropane Dihydride, and Vinyl Metal Trihydride Complexes," *J. Phys. Chem. A* **2008**, *112*, 6902-6907.
728. X. F. Wang, L. Andrews, R. Lindh, V. Veryazov, and B. O. Roos, "A Combined Theoretical and Experimental Study of Simple Terminal Group 6 Nitride and Phosphide  $N\equiv MX_3$  and  $P\equiv MX_3$  Molecules," *J. Phys. Chem. A* **2008**, *112*, 8030-8037.
729. X. F. Wang and L. Andrews, "Infrared Spectra, Structure and Bonding of the  $GeH_3--Cr$ ,  $HGe\equiv MoH_3$ ,  $HGe\equiv WH_3$  Molecules in Solid Neon and Argon," *Inorg. Chem.* **2008**, *47*, 8159-8166.
730. X. F. Wang and L. Andrews, "Infrared Spectra, Structure and Bonding of the Group 6  $M:NH_3$ ,  $H_2N-MH$ , and  $N\equiv MH_3$  Reaction Products in Solid Argon," *Organometallics* **2008**, *27*, 4885-4891.
731. X. F. Wang, L. Andrews, and C. J. Marsden, "Reactions of Uranium Atoms with Ammonia: Infrared Spectra and Relativistic Calculations of the  $U:NH_3$ ,  $H_2N-UH$ , and  $HN=UH_2$  Complexes," *Chem. Eur. Jour.* **2008**, *14*, 9192-9201.
732. X. F. Wang and L. Andrews, "Infrared Spectrum of the  $RuH_2(H_2)_4$  Complex in Solid Hydrogen," *Organometallics* **2008**, *27*, 4273-4276.
733. H.-G. Cho, J. T. Lyon, and L. Andrews, "Reactions of Laser-Ablated Fe Atoms with Halomethanes: Infrared Spectra, Density Functional Calculations and Structures of Simple Iron Insertion and Methylidene Complexes," *Organometallics* **2008**, *27*, 5241-5251.
734. H.-G. Cho and L. Andrews, "Infrared Spectra of Metallacyclopropane, Insertion, and Dihydrido Complex Products in Reactions of Laser-Ablated Group 6 Metal Atoms with Ethylene Molecules," *J. Phys. Chem. A* **2008**, *112*, 12071-12080.
735. H.-G. Cho and L. Andrews, "Preparation and Characterization of Simple Dihalomethylidene Platinum Dihalide Complexes in Reactions of Laser-Ablated Pt Atoms with Tetrahalomethanes," *J. Am. Chem. Soc.* **2008**, *130*, 15836-15841.
736. H.-G. Cho and L. Andrews, "Formation of Carbyne Complexes in Reactions of Laser-Ablated Os Atoms with Halomethanes: Characterization by C-H(X) and Os-H(X) Stretching Absorptions and Computed Structures," *Dalton Trans.* **2009**, 5858-5866.



737. X. F. Wang and L. Andrews, "Infrared Spectra, Structure and Bonding in the LiO<sub>2</sub>, LiO<sub>2</sub>Li, LiO and Li<sub>2</sub>O Molecules in Solid Neon," *Molecular Physics* **2009**, *107*, 739-748.
738. X. F. Wang and L. Andrews, "Infrared Spectra and Theoretical Calculations for Fe, Ru, and Os Metal Hydrides and Dihydrogen Complexes," *J. Phys. Chem. A* **2009**, *113*, 551-563.
739. H.-G. Cho and L. Andrews, "Infrared Spectrum of the CH<sub>3</sub>-PtH Complex in Solid Argon Prepared in the Oxidative C-H Insertion of Methane by Laser-Ablated Pt Atoms" *J. Phys. Chem. A* **2008**, *112*, 12293-12295.
740. H.-G. Cho and L. Andrews, "Infrared Spectra of Small Pt Insertion and Methylidene Complexes Prepared in Oxidative C-H(X) Reactions of Laser-Ablated Pt Atoms with Methane, Ethane, and Halomethanes," *Organometallics* **2009**, *28*, 1358-1368.
741. I. Infante, L. Gagliardi, X. F. Wang, and L. Andrews, "Binding motifs for lanthanide-hydrides: a combined experimental and theoretical study of the MH<sub>x</sub>(H<sub>2</sub>)<sub>y</sub> species (M= La-Gd; x=1-4; y=0-6)," *J. Phys. Chem. A* **2009**, *113*, 2446-2455.
742. B. Liang, X. F. Wang, and L. Andrews, "Infrared Spectra and Density Functional Theory Calculations of Group 10 Transition Metal Sulfide Molecules and Complexes," *J. Phys. Chem. A* **2009**, *113*, 3336-3343.
743. B. Liang, X. F. Wang, and L. Andrews, "Infrared Spectra and Density Functional Theory Calculations of Group 8 Transition Metal Sulfide Molecules," *J. Phys. Chem. A* **2009**, *113*, 5375-5384.
744. X. F. Wang, B. Liang, and L. Andrews, "Infrared Spectra and Density Functional Theory Calculations of Coinage Metal Sulfide Molecules," *Dalton Trans.* **2009**, 4190-4198.
745. H.-G. Cho and L. Andrews, "Matrix Infrared Spectra of Dihydrido Cyclic and Trihydrido Ethynyl Products from Reactions of Th and U Atoms with Ethylene Molecules," *J. Phys. Chem. A* **2009**, *113*, 5073-5081.
746. X. F. Wang, L. Andrews, M. Knitter, P.-Å. Malmqvist, and B. O. Roos, "An Experimental and Theoretical Investigation of Simple Terminal Group 6 Arsenide As≡MF<sub>3</sub> Molecules," *J. Phys. Chem. A* **2009**, *113*, 6064-6069.
747. R. Ma, D. Yuan, M. Chen, M. Zhou, X. F. Wang, and L. Andrews, "Infrared Spectrum of Carbon Trisulfide in Solid Argon," *J. Phys. Chem. A* **2009**, *113*, 4976-4981.
748. X. F. Wang, J. T. Lyon, and L. Andrews, "Formation and Calculations of the Simple Terminal Triplet Pnictinidene Molecules N≡MF<sub>3</sub>, P≡MF<sub>3</sub> and As≡MF<sub>3</sub> (M = Ti, Zr, Hf)," *Inorg. Chem.* **2009**, *48*, 6297-6302.

749. H.-G. Cho and L. Andrews, "Matrix Infrared Spectra of the C-H Insertion and Dihydrido Cyclic Products from Reactions of Group 3 Metal Atoms with Ethylene," *J. Phys. Chem. A* **2009**, *113*, 6677-6688.
750. L. Andrews, X. F. Wang, and B. O. Roos, "The  $\text{As}\equiv\text{UF}_3$  Molecule with a Weak Triple Bond to Uranium," *Inorg. Chem.* **2009**, *48*, 6594-6598.
751. X. F. Wang, L. Andrews, and C. Marsden, "Infrared Spectra and Density Functional Calculations of the  $\text{SUO}_2$  Molecule," *Inorg. Chem.* **2009**, *48*, 6888-6895.
752. X. F. Wang and L. Andrews, "Infrared Spectra and Density Functional Calculations for  $\text{SMO}_2$  Molecules ( $\text{M} = \text{Cr}, \text{Mo}, \text{W}$ )," *J. Phys. Chem. A* **2009**, *113*, 8934-8941.
753. X. F. Wang, L. Andrews, I. Infante and L. Gagliardi, "Matrix Infrared Spectroscopic and Computational Investigation of Late Lanthanide Metal Hydride Species  $\text{MH}_x(\text{H}_2)_y$  ( $\text{M} = \text{Tb} - \text{Lu}$ ;  $x=1-4$ ;  $y=0-3$ )," *J. Phys. Chem. A* **2009**, *113*, 12566-12572.
754. Y. Gong, M. Zhou, and L. Andrews, "Spectroscopic and Theoretical Studies of Transition Metal Oxides and Dioxygen Complexes," *Chem. Rev.* **2009**, *109*, 6765-6808.
755. X. F. Wang and L. Andrews, "Infrared Spectra and Density Functional Calculations of Triplet Pnictinidene  $\text{N}\div\text{ThF}_3$ ,  $\text{P}\div\text{ThF}_3$  and  $\text{As}\div\text{ThF}_3$  Molecules," *Dalton Trans.* **2009**, 9260-9265.
756. H.-G. Cho, L. Andrews, B. Vlaisavljevich and L. Gagliardi, "Infrared Spectra of Small Insertion and Methylidene Complexes in Reactions of Laser-Ablated Ni Atoms with Halomethanes," *Organometallics* **2009**, *28*, 5623-5632.
757. H.-G. Cho, L. Andrews, B. Vlaisavljevich, and L. Gagliardi, "Infrared Spectra of Small Insertion and Methylidene Complexes in Reactions of Laser-Ablated Pd Atoms with Halomethanes," *Organometallics* **2009**, *28*, 6871-6879.
758. H.-G. Cho and L. Andrews, "Infrared Spectra of Small Methylidene and Insertion Complexes Generated in Reactions of Laser-Ablated Rh Atoms with Halomethanes and Ethane," *Organometallics* **2010**, *29*, 2211-2222.
759. X. F. Wang, B. Roos, and L. Andrews, "Theoretical Calculations and Matrix Infrared Spectra of the Simple Terminal Borylene Complexes  $\text{FB}=\text{MF}_2$  ( $\text{M} = \text{Ti}, \text{Zr}, \text{Hf}$ )," *Angew. Chem.* **2010**, *122*, 161-164. *Angew. Chem. Intl. Ed.* **2010**, *49*, 157-160.
760. H.-G. Cho and L. Andrews, "Infrared Spectra of  $\text{CH}_2=\text{Zr}(\text{H})\text{NC}$ ,  $\text{CH}_3-\text{ZrNC}$ , and  $\eta^2-\text{Zr}(\text{NC})-\text{CH}_3$  Produced by Reactions of Laser-Ablated Zr Atoms with Acetonitrile," *J. Phys. Chem. A* **2010**, *114*, 891-897.
761. X. F. Wang and L. Andrews, "Infrared Spectra of the  $\text{MF}_2$ ,  $\text{MF}_2^+$ ,  $\text{MF}_4^-$ ,  $\text{MF}_3$  and  $\text{M}_2\text{F}_6$  Molecules ( $\text{M} = \text{Sc}, \text{Y}, \text{La}$ ) in Solid Argon," *J. Phys. Chem. A* **2010**, *114*, 2293-2299.

762. X. F. Wang, B. O. Roos, and L. Andrews, "Matrix Infrared Spectra and Electronic Structure Calculations of the First Actinide Borylene:  $\text{FB}=\text{ThF}_2$ " *Chem. Commun.* **2010**, 46, 1646-1648.
763. H.-G. Cho and L. Andrews, "Infrared Spectra of  $\text{CH}_2=\text{M}(\text{H})\text{NC}$ ,  $\text{CH}_3\text{-MNC}$ , and  $\eta^2\text{-M}(\text{NC})\text{-CH}_3$  Produced by Reactions of Laser-Ablated Group 5 Metal Atoms with Acetonitrile," *J. Phys. Chem. A* **2010**, 114, 5997-6006.
764. H.-G. Cho and L. Andrews, "Infrared Spectra of  $\text{XC}\equiv\text{IrX}_3$  and  $\text{CX}_2=\text{IrX}_2$  Prepared by Reactions of Laser-Ablated Iridium Atoms with Halomethanes," *Dalton Trans.* **2010**, 39, 5478-5489.
765. H.-G. Cho and L. Andrews, "Infrared Spectra of  $\text{CX}_2=\text{CoX}_2$  and  $\text{CX}_3\text{-CoX}$  Complexes from Reactions of Laser-Ablated Cobalt Atoms with Halomethanes," *J. Phys. Chem. A* **2010**, 114, 8056-8068.
766. H.-G. Cho and L. Andrews, "Infrared Spectra of  $\text{HC}\equiv\text{C-MH}$  and  $\text{M}-\eta^2\text{-(C}_2\text{H}_2)$  Produced in Reactions of Laser-Ablated Group 5 Transition-Metal Atoms with Acetylene," *J. Phys. Chem. A* **2010**, 114, 10028-10039.
767. X. F. Wang, L. Andrews, P.-Å. Malmqvist, B. O. Roos, A. P. Gonçalves, C. C. L. Pereira, J. Marçalo, C. Godart, and B. Villeroy, "Infrared Spectra and Quantum Chemical Calculations of Uranium Carbide Molecules UC and CUC with Triple Bonds," *J. Am. Chem. Soc.* **2010**, 132, 8484-8488.
768. B. Vlaisavljevich, L. Gagliardi, X. F. Wang, B. Liang, L. Andrews, and I. Infanti, "U and  $\text{P}_4$  Reaction Products: A Quantum Chemical and Matrix Isolation Spectroscopic Investigation," *Inorg. Chem.* **2010**, 49, 9230-9235.
769. L. Andrews, "Comparison of Calculated and Observed Vibrational Frequencies of New Molecules from an Experimental Perspective," Ch. 12, pp. 353-375 in *Computational Spectroscopy: Methods, Experiments and Applications*, J. Grunenberg, Ed., J. Wiley, **2010**.
770. I. Infante, L. Andrews, X. F. Wang, and L. Gagliardi, "Noble gas matrices may change the electronic structure of trapped molecules: the  $\text{UO}_2(\text{Ng})_4$  [ $\text{Ng}=\text{Ne}, \text{Ar}$ ] case," *Chem. Eur. Jour.* **2010**, 16, 12804-12807.
771. S. Riedel, T. Kochner, X. F. Wang, and L. Andrews, "Polyfluoride Anions: a Matrix-Isolation and Quantum-Chemical Investigation," *Inorg. Chem.* **2010**, 49, 7156-7164.
772. H.-G. Cho and L. Andrews, "Infrared Spectra of Infrared Spectra of  $\text{CX}_3\text{-MnX}$  and  $\text{CX}_2=\text{MnX}_2$  ( $\text{X} = \text{H}, \text{F}, \text{Cl}$ ) Prepared in Reactions of Laser-Ablated Manganese Atoms with Halomethanes," *Organometallics* **2011**, 30, 477-486.
773. Y. Gong, M. Zhou, L. Andrews, T. Schroder, and S. Riedel, "Is Rhodium Tetroxide in the Formal Oxidation State VIII Stable? A Quantum-Chemical and Matrix-Isolation Investigation of Rhodium Oxides," *Theoretical Chemistry Accounts*, **2011**, 129, 667-676.

774. X. F. Wang, H-G. Cho, L. Andrews, M. Chen, D. A. Dixon, H-S. Hu, and J. Li “Matrix Infrared Spectroscopic and Computational Investigations of the Lanthanide Metal Atom-Methylene Fluoride Activation Products  $\text{CH}_2\text{-LnF}_2$  with Single Ln-C Bonds,” *J. Phys. Chem. A* **2011**, *115*, 1913-1921.
775. X. F. Wang and L. Andrews, “Quantum Chemical Calculations and Infrared Spectra of the  $(\text{F}_2)\text{MF}_2$  Molecules (M = B, Al, Ga, In and Tl) in Solid Matrices: A New Class of Very High Electron Affinity Neutral Molecules,” *J. Am. Chem. Soc.* **2011**, *133*, 3768-3771.
776. X. F. Wang, L. Andrews, B. Vlasisavljevich, and L. Gagliardi, “Combined Triple and Double Bonds to Uranium: the  $\text{N}\equiv\text{U}=\text{N}-\text{H}$  Uranimine Nitride Molecule Prepared in Solid Argon,” *Inorg. Chem.* **2011**, *50*, 3826-3831.
777. L. Andrews, “Metal Atom Reactions to Form Novel Small Molecules,” Ch. 2. pp. 25-49 in *Physics and Chemistry at Low Temperatures*, L. Khriachtchev, Ed. Pan Stanford, **2011**.
778. X. F. Wang and L. Andrews, “Infrared Spectra of Rh atom Reaction products with  $\text{C}_2\text{H}_2$ : The  $\text{HRhCCH}$ ,  $\text{RhCCH}$ ,  $\text{RhCCH}_2$ , and  $\text{Rh-}\eta^2\text{-C}_2\text{H}_2$  Molecules,” *J. Phys. Chem. A* **2011**, *115*, 9447-9455.
779. Y. Gong and L. Andrews, “Infrared Spectrum of the  $\text{CH}_3\text{OCH}_2$  Radical in Solid Argon,” *J. Phys. Chem. A* **2011**, *115*, 3029-3033.
780. H.-G. Cho and L. Andrews, “Infrared Spectra of the Ethynyl Metal Hydrides Produced in Reactions of Laser-Ablated Mn and Re Atoms with Acetylene,” *J. Phys. Chem. A* **2011**, *115*, 4929-4934.
781. M. Chen, D. A. Dixon, X. F. Wang, H-G. Cho, and L. Andrews, “Matrix Infrared Spectroscopic and Computational Investigations of the Lanthanide Metal Atom-Methyl Fluoride Activation Products  $\text{CH}_3\text{-LnF}$  and  $\text{CH}_2\text{-LnHF}$  with Single Ln-C Bonds,” *J. Phys. Chem. A* **2011**, *115*, 5609-5624.
782. Y. Gong, X. F. Wang, L. Andrews, M. Chen, and D. A. Dixon “Infrared Spectra and Quantum Chemical Calculations of the Bridge Bonded  $\text{HC(F)LnF}_2$  (Ln = La-Lu) Complexes,” *Organometallics* **2011**, *30*, 4443-4452.
783. Y. Gong and L. Andrews, “Matrix Infrared Spectroscopic and Theoretical Investigations of Uranium Atom and Methanol Reaction Products,” *Inorg. Chem. A* **2011**, *50*, 7099-7105.
784. X. F. Wang, L. Andrews, D. Ma, L. Gagliardi, A. P. Gonçalves, C. C. L. Pereira, J. Marçalo, C. Godart, and B. Villeroy, “Infrared Spectra and Quantum Chemical Calculations of the Uranium-Carbon Molecules UC, CUC, UCH, and  $\text{U}(\text{CC})_2$ ,” *J. Chem. Phys.* **2011**, *134*, 244313. DOI: 10.1063/1.
785. Y. Gong and L. Andrews, “Matrix Infrared Spectroscopic and Density Functional Theoretical Investigations on Thorium and Uranium Atom Reactions with Dimethyl Ether,” *Dalton Trans.* **2011**, *40*, 11106-11114.

786. H.-G. Cho and L. Andrews, "Infrared Spectra of CH<sub>3</sub>-MH, CH<sub>3</sub>-M, and CH<sub>3</sub>-MH<sup>-</sup> Prepared via Methane Activation by Laser-Ablated Au, Ag, and Cu Atoms," *Dalton Trans.* **2011**, 40, 11115-11124.
787. H.-G. Cho and L. Andrews, "Matrix Infrared Spectra and Density Functional Calculations of the H<sub>2</sub>CCN and H<sub>2</sub>CNC Radicals Produced from CH<sub>3</sub>CN," *J. Phys. Chem. A* **2011**, 115, 8638-8642.
788. L. Andrews, X. F. Wang, B. Liang, F. Ruiperez, I. Infante, A. D. Raw, and J. A. Ibers, "Matrix infrared spectroscopy and a theoretical investigation of the SUO and US<sub>2</sub> molecules," *Eur. J. Inorg. Chem.* **2011**, 4457-4463.
789. H.-G. Cho and L. Andrews, "Infrared Spectra of CH<sub>3</sub>-MF and Several Fragments Prepared by Methyl Fluoride Reactions with Laser-Ablated Au, Ag, and Cu Atoms," *Inorg. Chem.* **2011**, 50, 10319-10327.
790. Y. Gong and L. Andrews, "Matrix Infrared Spectroscopic and Theoretical Studies on the Reactions of Scandium, Yttrium and Lanthanide Metal Atoms with Dimethyl Ether," *J. Phys. Chem. A* **2011**, 115, 11624-11631.
791. Q. Wang, X. F. Wang, and L. Andrews, "The HRuCCH, RuCCH<sub>2</sub>, and Ru- $\eta^2$ -C<sub>2</sub>H<sub>2</sub> Molecules: Infrared Spectra and Density Functional Calculations," *J. Phys. Chem. A* **2011**, 115, 12194-12200.
792. X. F. Wang and L. Andrews, "The Tetrahydrometalate Species VH<sub>2</sub>(H<sub>2</sub>), NbH<sub>4</sub>, and TaH<sub>4</sub>: Matrix Infrared Spectra and Quantum Chemical Calculations," *J. Phys. Chem. A* **2011**, 115, 14175-14183.
793. Y. Gong, L. Andrews, M. Chen, and D. A. Dixon, "Reactions of Late Lanthanide Metal Atoms and Methanol in Solid Argon: A Matrix Isolation Infrared Spectroscopic and Theoretical Study," *J. Phys. Chem. A* **2011**, 115, 14581-14592.
794. L. Andrews, Y. Gong, B. Liang, V. E. Jackson, R. Flamerich, S. Li, and D. A. Dixon, "Matrix Infrared Spectra and Theoretical Studies of Thorium Oxide Species: ThO<sub>x</sub> and Th<sub>2</sub>O<sub>y</sub>," *J. Phys. Chem. A* **2011**, 115, 14407-14416. [Cover art for this issue].
795. H.-G. Cho and L. Andrews, "Infrared Spectra of the  $\eta^2$ -M(NC)-CH<sub>3</sub>, CH<sub>3</sub>-MNC, and CH<sub>2</sub>=M(H)NC Complexes Prepared by Reactions of Th and U Atoms with Acetonitrile," *Organometallics* **2011**, 30, 535-544. [Cover art for this issue].
796. Y. Gong and L. Andrews, "Matrix Infrared Spectroscopic and Theoretical Studies on Coinage Metal Amide Fluoride Complexes: F<sub>2</sub>NMF (M=Cu, Ag, Au)," *Inorg. Chem.* **2012**, 51, 667-673.
797. H.-G. Cho and L. Andrews, "Infrared Spectra and Density Functional Calculations of the M $\leftarrow$ NCCCH<sub>3</sub>,  $\eta^2$ -M(NC)-CH<sub>3</sub>, CH<sub>3</sub>-MNC, CH<sub>2</sub>=M(H)NC, and CH $\equiv$ M(H)<sub>2</sub>NC Complexes Produced by Reactions of Group 6 Metal Atoms with Acetonitrile," *J. Organomet. Chem.* **2012**, 703, 25-33.

798. Y. Gong, X. F. Wang, L. Andrews, T. Schlöder, and S. Riedel, "Infrared Spectroscopic and Theoretical Studies of the OUF<sub>2</sub> and OThF<sub>2</sub> Molecules with Triple Oxo Bond Character," *Inorg. Chem.* **2012**, *51*, 6983–6991.
799. Y. Gong, L. Andrews, A. P. Gonçalves, C.L. Pereira, and J. Marçalo, "Infrared Spectra of Rh<sup>12</sup>C and Rh<sup>13</sup>C in Solid Argon and Neon," *Chem. Phys. Letts.* **2012**, *528*, 7-10.
800. Y. Gong, L. Andrews, and C. W. Bauschlicher, Jr. "Formation of Metal Oxide Fluorides from Specific Reactions with Oxygen Difluoride: Infrared Spectroscopic and Theoretical Investigations of the Terminal Oxide Radical OScF<sub>2</sub> and the OScF with Triple Oxo Bond Character," *Chem. Eur. J.*, **2012**, *18*, 12446-12451.
801. Y. Gong, L. Andrews, C. A. Bauschlicher, Jr., and D. A. Dixon "Infrared Spectroscopic and Theoretical Studies of the OTiF<sub>2</sub>, OZrF<sub>2</sub> and OHfF<sub>2</sub> Molecules with Terminal Oxo Ligands," *Dalton Trans.* **2012**, *41*, 11706 -11715.
802. L. Andrews, X. F. Wang, Y. Gong, T. Schlöder, S. Riedel, and M. J. Franger. "Spectroscopic Observation of Mercury Oxyfluoride: a Matrix-isolation and Quantum-Chemical Investigation," *Angew. Chem. Intl. Ed.* **2012**, *51*, 8235-8238.
803. X. F. Wang, L. Andrews, K. Willmann, F. Brosi, and S. Riedel "Investigation of Gold Fluorides and Noble Gas Complexes by Matrix-Isolation Spectroscopy and Quantum-Chemical Calculations," *Angew. Chem. Int. Ed.* **2012**, *51*, 10628-10632.
804. H.-G. Cho and L. Andrews, "Infrared Spectra of CH<sub>3</sub>-MH through Methane Activation by Laser-Ablated Sn, Pb, Sb, and Bi Atoms," *J. Phys. Chem. A* **2012**, *116*, 8500-8506.
805. H.-G. Cho and L. Andrews, "Infrared Spectra of the Os←NCCH<sub>3</sub>, Re←NCCH<sub>3</sub>, CH<sub>3</sub>-ReNC, CH<sub>2</sub>=Re(H)NC, CH≡Re(H)<sub>2</sub>NC Complexes and their Mn Counterparts Prepared by Reactions of Laser-Ablated Os, Re and Mn Atoms with Acetonitrile in Excess Argon," *Organometallics* **2012**, *31*, 6095-6105.
806. Y. Gong, L. Andrews V. E. Jackson, and D. A. Dixon, Methane to Methanol Conversion Catalyzed by ThO through the CH<sub>3</sub>Th(O)H Intermediate, *Inorg. Chem.* **2012**, *51*, 11055-11060.
807. H.-G. Cho and L. Andrews, Infrared Spectra of M-η<sup>2</sup>-C<sub>2</sub>H<sub>2</sub>, HM-C≡CH, and HM-C≡CH<sup>-</sup> Prepared in Reactions of Laser-Ablated Group 3 Metal Atoms with Acetylene, *J. Phys. Chem. A* **2012**, *116*, 10917-10926.
808. H.-G. Cho, J. T. Lyon, and L. Andrews, Infrared Spectra of M-η<sup>2</sup>-C<sub>2</sub>H<sub>2</sub> and HM-C≡CH Produced in Reactions of Laser-Ablated Group 6 Metal Atoms with Acetylene, *J. Phys. Chem. A* **2012**, *116*, 11880-11889.

809. Y. Gong, L. Andrews, and C. A. Bauschlicher, Jr., "Reactions of Group 3 Metals with OF<sub>2</sub>: Infrared Spectroscopic and Theoretical Investigations of the Group 3 Oxydifluoride OMF<sub>2</sub> and Oxyfluoride OMF Molecules," *J. Phys. Chem. A* **2012**, *116*, 10115-10121.
810. X. Liu, X.-F. Wang, Q. Wang, and L. Andrews, "OMS, OM( $\eta^2$ -SO), and OM( $\eta^2$ -SO)( $\eta^2$ -SO<sub>2</sub>) Molecules (M = Ti, Zr, Hf): Infrared Spectra and Density Functional Calculations," *Inorg. Chem.* **2012**, *51*, 7415-7424.
811. B. Villeroy, A.P. Gonçalves, G. Delaizir, C.C.L. Pereira, J. Marçalo, X. F. Wang, L. Andrews, and C. Godart, "Preparation of Dense <sup>13</sup>C Pellets Using the Spark Plasma Sintering Technique," *Materials Research Innovations* **2013**, *17*, 289-292.
812. X. Liu, X. F. Wang, Q. Wang, and L. Andrews, "Spontaneous Sulfur Dioxide Activation by Group V Metal (V, Nb, Ta) Atoms in Excess Argon at Cryogenic Temperatures," *Phys. Chem. Chem. Phys.*, **2013**, *15*, 9823-9832.
813. X. F. Wang, L. Andrews, F. Brosi, and S. Riedel, "Investigation of Gold Fluorides and Noble Gas Complexes," by Matrix-Isolation Spectroscopy and Quantum-Chemical Calculations. *Chem. Eur. J.* **2013**, *19*, 1397-1410.
814. H.-G. Cho and L. Andrews, "Infrared Spectra and Density Functional Calculations for New iso-Halomethanes: CHCl<sub>2</sub>-Cl, CHFCl-Cl, CFCl<sub>2</sub>-Cl, CHBr<sub>2</sub>-Br, and CBr<sub>3</sub>-Br in Solid Argon," *J. Phys. Chem. A* **2013**, *117*, 6525-6535.
815. H.-G. Cho and L. Andrews, "Infrared Spectra of CH<sub>3</sub>-MX Prepared in Reactions of Laser-Ablated Gold, Platinum, Palladium, and Nickel Atoms with CH<sub>3</sub>Cl and CH<sub>3</sub>Br," *Organometallics* **2013**, *32*, 2753-2759.
816. H.-G. Cho and L. Andrews, "Infrared Spectra of Manganese Insertion, Vinyl, and Cyclic Complexes Prepared in Reactions of Laser-Ablated Mn Atoms with Methane, Ethane, Ethyl Chloride, and 1,2-Dichloroethane," *Organometallics* **2013**, *32*, 3458-3468.
817. L. Andrews, K. Thanthiriwatte, X. F. Wang, and D. A. Dixon, "Thorium Fluorides ThF, ThF<sub>2</sub>, ThF<sub>3</sub>, ThF<sub>4</sub>, ThF<sub>3</sub>(F<sub>2</sub>), and ThF<sub>6</sub><sup>-</sup> Characterized by Infrared Spectra in Solid Argon and Electronic Structure and Vibrational Frequency Calculations," *Inorg. Chem.* **2013**, *52*, 8228-8233.
818. L. Andrews, X. F. Wang, Y. Gong, B. Vlasisavljevich, and L. Gagliardi, "Infrared Spectra and Electronic Structure Calculations for the NUN(NN)<sub>1-5</sub> and NU(NN)<sub>1-6</sub> Complexes in Solid Argon," *Inorg. Chem.* **2013**, *52*, 9989-9993.
819. X. F. Wang, L. Andrews, K. Thanthiriwatte, and David A. Dixon, "Infrared Spectra of H<sub>2</sub>Th=S and H<sub>2</sub>U=S in Noble Gas Matrices: Enhanced Covalent Bonding," *Inorg. Chem.* **2013**, *52*, 19275-10285.

820. T. Vent-Schmidt, R. D. Hunt, L. Andrews and S. Riedel, "Formation and Characterization of HUF and DUF in Solid Argon," *Chem. Commun.* **2013**, 49, 3863-3865.
821. C. Pereira, R. Maurice, A. Lucena, S. Hu, A. Gonçalves, M. Antonio; J. Marçalo, J. Gibson, L. Andrews, and L. Gagliardi, "Thorium and Uranium Carbide Cluster Cations in the Gas Phase: Similarities and Differences between Th and U," *Inorg. Chem.* **2013**, 52, 10968-10975.
822. K. S. Thanthiriwatte, X. F. Wang, L. Andrews, D. A. Dixon, J. Metzger, T. Vent-Schmidt, and S. Riedel, "Properties of  $\text{ThF}_x$  from Infrared Spectra in Solid Argon and Neon with Supporting Electronic Structure and Thermochemical Calculations," *J. Phys. Chem. A* **2014**, 118, 2107-2119.
823. T. Mikulas, M. Chen, D. A. Dixon, K. A. Peterson, Y. Gong, and L. Andrews, "Reactions of Lanthanide Atoms with Oxygen Difluoride and the Role of the Ln Oxidation State," *Inorg. Chem.* **2014**, 53, 446-456.
824. H.-S. Hu, F. Wei, X.-F. Wang, L. Andrews, and J. Li, "Actinide-Silicon Multiradical Bonding: Infrared Spectra and Electronic Structures of the  $\text{XSiAnF}_3$  and  $\text{Si}(\mu\text{-X})\text{AnF}_3$  (An = Th, U; X = H, F) Molecules," *J. Am. Chem. Soc.* **2014**, 136, 1427-1437.
825. L. Andrews, X. F. Wang, Y. Gong, G. P. Kushto, B. Vlaisavljevich, and L. Gagliardi, "Infrared Spectra and Electronic Structure Calculations for NN Complexes with U, UN, and NUN in Solid Argon, Neon, and Nitrogen," *J. Phys. Chem. A* **2014**, 118, 5289-5303.
826. L. Andrews, "The Products of Laser Ablated Thorium Atom Reactions with Small Molecules," Ch 1, pp. 1-28 in *Thorium: Chemical Properties, Uses and Environmental Effects*, Nova Science Publishers, Inc., 400 Oser Avenue, Suite 1600, Hauppauge, NY 11788, USA, **2014**.
827. X. Liu, X.-F. Wang, Q. Wang, and L. Andrews, "Spectroscopic Observation of Photo-Induced Metastable Linkage Isomers of Coinage Metal (Cu, Ag, Au) Sulfur Dioxide Complexes," *Phys. Chem. Chem. Phys.* **2014**, 16, 2607-2620.
828. H.-G. Cho and L. Andrews, "Infrared Spectra of  $\text{CX}_3\text{AuCl}$  and  $\text{CX}_2\text{AuCl}_2$  Generated in Reactions of Laser-Ablated Gold Atoms with Chlorofluoromethanes and Carbon Tetrachloride," *Organometallics* **2014**, 33, 4315-4322.
829. T. Vent-Schmidt, L. Andrews, and S. Riedel, "Reactions of Laser-Ablated U Atoms with HF: Infrared Spectra and Quantum Chemical Calculations of HUF, UH, and UF in Noble Gas Solids," *J. Phys. Chem. A* **2015**, 119, 2253-2261.
830. H.-G. Cho and L. Andrews, "Methane Activation by Laser-Ablated Th Atoms: Matrix Infrared Spectra and Theoretical Investigations of  $\text{CH}_3\text{-Th-H}$  and  $\text{CH}_2=\text{ThH}_2$ ," *J. Phys. Chem. A* **2015**, 119, 2289-2297.



831. H.-G. Cho and L. Andrews, "Matrix Infrared Spectra and Density Functional Calculations of CH<sub>2</sub>Cl-Cl and CH<sub>2</sub>Br-Br Produced by Laser-ablated Metal Plume Irradiation," *Bull. Korean Chem. Soc.* **2015**, *36*, 1580-1585.
832. T. Vent-Schmidt, L. Andrews, and S. Riedel, "Investigation of Thorium Hydride Fluorides by Matrix-Isolation Spectroscopy," *J. Fluorine Chem.* **2015**, *174*, 2-7.
833. Y. Gong, L. Andrews, B. K. Liebov, Z. Fang, E. B. Garner, III, and D. A. Dixon, "Reactions of Laser-ablated U Atoms with (CN)<sub>2</sub>: Infrared Spectra and Quantum Chemical Calculations of UNC, U(NC)<sub>2</sub>, and U(NC)<sub>4</sub> in Solid Argon," *Chem. Comm.* **2015**, *51*, 3899-3902.
834. H.-G. Cho and L. Andrews, "Infrared Spectra of M- $\eta^2$ -C<sub>2</sub>H<sub>2</sub> and HM-CCH Produced in Reactions of Laser-ablated Fe and Os Atoms with Acetylene," *J. Mol. Spectrosc.* **2015**, *310*, 84-91.
835. K. S. Thanthiriwatte, M. Vasiliu, S. R. Battey, Q. Lu, K. A. Peterson, L. Andrews, and D. A. Dixon, "Gas Phase Properties of MX<sub>2</sub> and MX<sub>4</sub> (X=F, Cl) for M = Group 4, Group 14, Ce, and Th," *J. Phys. Chem. A*, **2015**, *119*, 5790-5803.
836. Y. Gong, H.-G. Cho, and L. Andrews, "Reactions of Laser-Ablated U Atoms with HCN: Infrared Spectra in Solid Argon and Quantum Chemical Calculations for HUNC," *Eur. J. Inorg. Chem.* **2015**, 2974-2981.
837. H.-G. Cho and L. Andrews, "Infrared Spectra of Planar and Agostic-like Bridged Scandium Methylidene Complexes Prepared in Reactions of Laser-Ablated Sc Atoms with Di-, Tri-, and Tetrahalomethanes," *Organometallics*, **2015**, *34*, 3390-3399.
838. T. Vent-Schmidt, F. Brosi, J. Metzger, T. Schlöder, X. F. Wang, L. Andrews, C. Müller, H. Beckers, and S. Riedel, "Fluorine-Rich Fluorides: New Insights into the Chemistry of Polyfluoride Anions," *Angew. Chem. Int. Ed.*, **2015**, *54*, 8279-8283.
839. H.-G. Cho and L. Andrews, "Infrared Spectra and DFT Calculations of M- $\eta^2$ -(NC)-CH<sub>3</sub>, CH<sub>3</sub>-MNC, and CH<sub>2</sub>=M(H)NC Prepared by Reactions of Laser-Ablated Hf and Ti Atoms with Acetonitrile," *Eur. J. Inorg. Chem.* **2015**, 4379-4387.
840. T. Vent-Schmidt, L. Andrews, K. S. Thanthiriwatte, D. A. Dixon, and S. Riedel, "Reaction of Laser Ablated Uranium and Thorium Atoms with H<sub>2</sub>Se: A Rare Example for Selenium Multiple Bonding," *Inorg. Chem.* **2015**, *54*, 9761-9769.
841. J. T. Lyon, H.-G. Cho, and L. Andrews, "Matrix Infrared Spectroscopic and Theoretical Studies of the Reactions Between Group 5 Transition Metal Atoms and CX<sub>4</sub> Molecules (X = H, F, and Cl)," *J. Phys. Chem. A*, **2015**, *119*, 5790-5803.
842. A. Wilson, T. Nguyen, F. Brosi, X. F. Wang, L. Andrews, S. Riedel, A. Bridgeman, and N. Young. "A Matrix Isolation and Computational Study of Molecular Palladium Fluorides: Does PdF<sub>6</sub> Exist?" *Inorg. Chem.* **2016**, *55*, 1108-23.

843. T. Mikulas, M. Chen, Z. Fang, K. A. Peterson, L. Andrews, and D. A. Dixon, "Structures and Properties of the Products of the Reaction of Lanthanide Atoms with H<sub>2</sub>O," *J. Phys. Chem. A*, **2016**, *120*, 793-804.
844. B. Vlasisavljevich, L. Andrews, X. F. Wang, Y. Gong, G. Kushto, and B. E. Bursten, "Detection and Electronic Structure of Naked Actinide Complexes: Rhombic-Ring (AnN)<sub>2</sub> Molecules Stabilized by Delocalized Pi-Bonding," *J. Am. Chem. Soc.* **2016**, *138*, 893-905.
845. H-G. Cho and L. Andrews, "Infrared Spectra and DFT Calculations of the SiH<sub>2</sub>-(CH<sub>2</sub>)<sub>2</sub> and CH<sub>2</sub>=CH-SiH<sub>3</sub> Intermediates in Reactions of Laser-Ablated Silicon Atoms with Ethane," *Bull. Korean Chem. Soc.* **2016**, *37*, 415-417.
846. Z. Fang, K. S. Thanthiriwatte, D. A. Dixon, L. Andrews, and X. F. Wang, "Properties of Cerium Hydroxides from Matrix Infrared Spectra and Electronic Structure Calculations," *Inorg. Chem.* **2016**, *55*, 1702-1714.
847. H-G. Cho and L. Andrews, "Infrared Spectra and Density Functional Calculations for Singlet CH<sub>2</sub>=SiX<sub>2</sub> and Triplet HC-SiX<sub>3</sub> Intermediates in Reactions of Laser-Ablated Silicon Atoms with Di-, Tri-, and Tetrahalomethanes," *Inorg. Chem.* **2016**, *55*, 2819-2829.
848. L. Andrews and H-G. Cho, "Matrix Infrared Spectra and Quantum Chemical Calculations of Ti, Zr, and Hf Dihydride Phosphinidene and Arsinidene Molecules," *Inorg. Chem.* **2016**, *55*, 8786-8793.
849. H-G. Cho and L. Andrews, "Infrared Spectra of Planar and Bridged Methylidenes Prepared in Reactions of Laser-Ablated Yttrium and Lanthanum Atoms with Di-, Tri-, and Tetrahalomethanes," Han-Gook Cho and L. Andrews, *Eur. J. Inorg. Chem.* **2016**, 380-392.
850. H-G. Cho and L. Andrews, "Infrared Spectra of SiH<sub>2</sub>-(CH<sub>2</sub>)<sub>2</sub>, and CH<sub>2</sub>=CH-SiH<sub>3</sub> Prepared in Reactions of Laser-Ablated Silicon Atoms with Ethane," *Bull. Kor. Chem. Soc.* **2016**, *37*, 415-417.
851. H-G. Cho and L. Andrews, "Matrix Preparation and Spectroscopic and Theoretical Investigation of Small High Oxidation-State Complexes of Group 3-12 and 14, Lanthanide and Actinide Metal Atoms," *Coord. Chem. Rev.* **2017**, *335*, 76-102.
852. L. Andrews, H-G. Cho, K. Thanthiriwatte, and David A. Dixon, "Thorium and Uranium Hydride Phosphorus and Arsenic Bearing Molecules with Single and Double Actinide-Pnictogen and Bridged Agostic Hydrogen Bonds," *Inorg. Chem.* **2017**, *56*, 2949-2957.
853. X.-F. Wang, L. Andrews, Z. Fang, K. Thanthiriwatte, M. Chen, and D. Dixon, "The Properties of Lanthanide Metal Hydroxide Molecules Produced in the Reactions of Ln Atoms with H<sub>2</sub>O<sub>2</sub>," *J. Phys. Chem. A*, **2017**, *121*, 1779-1796.

854. H-G. Cho and L. Andrews, "Observation and Characterization of  $\text{CH}_3\text{CH}_2\text{-MH}$ ,  $(\text{CH}_2)_2\text{-MH}_2$ , and  $\text{CH}_3\text{-C}\equiv\text{MH}_3$  Prepared in Reactions of Ethane with Laser-Ablated Group 6 Metal Atoms," *Organometallics*, **2017**, *36*, 1479-1487.
855. X. Chen, Q. Li, Y. Gong, L. Andrews, B. K. Liebov, Z. Fang, and D. A. Dixon, "Formation and Characterization of Homoleptic Thorium Isocyanide Complexes," *Inorg. Chem.*, **2017**, *56*, 5060-5068.
856. L. Andrews, H-G. Cho, K. Thanthiriwatte, and D. A. Dixon, "Thorium and Uranium Hydride Phosphorus and Arsenic Bearing Molecules with Single and Double Actinide-Pnictogen and Bridged Agostic Hydrogen Bonds," *Inorg. Chem.* **2017**, *56*, 2949-2957.
857. X. F. Wang, L. Andrews, Z. Fang, K. Thanthiriwatte, M. Chen, and D. A. Dixon, "The Properties of Lanthanide Metal Hydroxide Molecules Produced in the Reactions of Ln Atoms with  $\text{H}_2\text{O}_2$  and  $\text{H}_2 + \text{O}_2$  Mixtures," *J. Phys. Chem. A*, **2017**, *121*, 1779-1796.
858. B. Xu, P. Shi, T. Huang, X. F. Wang, and L. Andrews, "Double and Triple Si-H-M Bridge Bonds: Matrix Infrared Spectra and Theoretical Calculations for Reaction Products of Silane with Ti, Zr, and Hf Atoms," *J. Phys. Chem. A*, **2017**, *121*, 3898-3908.
859. H-G. Cho and L. Andrews, "Observation and Characterization of  $\text{CH}_3\text{CH}_2\text{-MH}$ ,  $(\text{CH}_2)_2\text{-MH}_2$ ,  $\text{CH}_2=\text{CH-MH}_3$ , and  $\text{CH}_3\text{-C}\equiv\text{MH}_3^-$  Produced by Reactions of Group 5 Metal Atoms with Ethane," *J. Phys. Chem. A*, **2017**, *121*, 6766-6777.
860. R. Wei, Q. Li, Y. Gong, L. Andrews, Z. Fang, K. S. Thanthiriwatte, M. Vasiliu, and D. A. Dixon. "Infrared Spectroscopic and Theoretical Studies on the  $\text{OMF}_2$  and  $\text{OMF}$  ( $\text{M}=\text{Cr}$ ,  $\text{Mo}$ ,  $\text{W}$ ) Molecules in Solid Argon," *J. Phys. Chem. A*, **2017**, *121*, 7603-7612.
861. H-G. Cho and L. Andrews, "Matrix Infrared Spectra of Insertion and Metallocyclopropane Complexes [ $\text{CH}_3\text{CH}_2\text{-MH}$  and  $(\text{CH}_2)_2\text{-MH}_2$ ] Prepared in Reactions of Laser-Ablated Group 3 Metal Atoms with Ethane," *J. Phys. Chem. A*, **2017**, *121*, 8583-8595.
862. X. Chen, Q. Li, L. Andrews, and Y. Gong, "Matrix Infrared Spectra of Manganese and Iron Isocyanide Complexes," *J. Phys. Chem. A*, **2017**, *121*, 8835-8842.
863. W. Yu, L. Andrews and X. F. Wang, "Infrared Spectroscopic and Electronic Structure Investigations of Beryllium Halide Molecules and Cations in Noble Gas Matrices," *J. Phys. Chem. A*, **2017**, *121*, 8843-8855.
864. Bing Xu, Li Li, Peipei Shi, Wenjie Yu, Jie Zhao, Xuefeng Wang, and Lester Andrews, "Matrix Infrared Spectra and Structures of  $\text{HM-SiH}_3$  ( $\text{M} = \text{Ge}$ ,  $\text{Sn}$ ,  $\text{Pb}$ ,  $\text{Sb}$ ,  $\text{Bi}$ ,  $\text{Te}$  Atoms)," *J. Phys. Chem. A*, **2018**, *122*, 81-88.
865. Z. Fang, E. B. Garner, III, D. A. Dixon, L. Andrews, Y. Gong, and B. K. Liebov, "Laser-Ablated U Atom Reactions with  $(\text{CN})_2$  to Form  $\text{UNC}$ ,  $\text{U}(\text{NC})_2$ , and  $\text{U}(\text{NC})_4$ : Matrix Infrared Spectra and Quantum Chemical Calculations," *J. Phys. Chem. A*, **2018**, *122*, 516-528. DOI: 10.1021/acs.jpca. .

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