SPECTROSCOPY OF MASS-SELECTED SMALL TRANSITIONS METALS CLUSTERS ON ARGON MATRICES

HANAE HAOUARI, HUAIMING WANG, ROBERT CRAIG, JOHN R. LOMBARDI and D. M. LINDSAY,
Department of Chemistry, City College of New York, NY 10031.

During recent years interest in studies of the formation and properties of small atomic and molecular clusters systems has grown enormously. This is due to recognition that results in this area contribute to a more complete understanding of interphase physics and related problems of condensation and nucleation phenomena, the formation and properties of surfaces, and ultimately, the condensed state. Mainly, this interest arises from the relevance of clusters to surface science in general, and heterogeneous catalysis in particular. We report on the deposition "soft-landing" of size selected Nickel dimers, Rhodium dimers. Zirconium trimers and Tantalum tetramers in solid argon matrices. Neutralized clusters samples deposited on argon matrices were interrogated insitu by an equivalent of optical absorption referred to as "scattering, depletion," and Raman spectroscopy. Illustration of the ion beam production and clusters formation will be explained in detail. The information about the geometry, electroni c and vibrational structure, dissociation energies and forces constants are determined from Raman spectroscopy, Absorption and Raman profiles.

Time required: 15 min
Session in which paper is recomended for presentation: