INFRARED SPECTROSCOPY AND STRUCTURES OF MASS-SELECTED RHODIUM CARBONYL AND RHODIUM DINITROGEN CATIONS

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Rhodium carbonyl cations, $Rh(CO)_n^+$, and rhodium dinitrogen cations, $Rh(N_2)_n^+$, are produced by laser vaporization in a pulsed-nozzle molecular beam source. Mass-selected infrared photodissociation spectroscopy of these ions and their argon tagged analogs are compared to density functional theory computations. Structures of the rhodium cations are determined based upon the number, frequency position and relative intensity of the infrared active bands between 2000 and 2400 cm^{-1}. Computed binding energies and fragmentation patterns suggest that four carbonyl ligands bind strongly to the central rhodium cation.