Enhancement Title and Abstract

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Chem 370 Enhancement

Title: The Dependence of Octahedral d-Orbital Splitting on Changes in Transition Metals and Ligands

Abstract: The d-orbital energies of transition metals are dependent on different factors including the identity of the metal, the shape of the complex, and the electronic effects of the complex’s ligands. These effects lead to the non-degeneracy of the complex’s d-orbitals, which can be measured through electronic spectra. A Vernier UV-Vis spectrometer was used to obtain the λ-max values of each complex’s UV absorption. Wavelengths were then converted to energies. To observe changes in energies, different first row transition metals and their aquo or ammine complexes were analyzed. The trend of moving across the first row of transition metals from left to right resulted in an increase of the d-orbital energy gap. Additionally, a transition from aquo complexes to ammine complexes illustrated an increase in the d-orbital splitting pattern. These observations were supported by topics covered in Inorganic Chemistry (Chem 370).