

PROBING THE EFFECTS OF ELECTRON CORRELATION: THE NOT-SO-SIMPLE CASE OF Gd_2O

JARRETT MASON, ABBEY McMAHON, CALEB D HUIZENGA, CAROLINE CHICK JARROLD, *Department of Chemistry, Indiana University, Bloomington, IN, USA.*

Understanding the nuances of electron correlation is a central challenge to the development and practical implementation of strongly correlated electronic materials with applications spanning from spintronics to single molecule magnets and beyond. Electron correlation is also important in governing photodetachment and photoionization processes; previously reported photoelectron spectra of small samarium suboxide cluster anions revealed an increase in excited state band intensities with decreasing photon energies, opposite of what is expected to arise from threshold effects. This phenomenon has been attributed to strong photoelectron-valence electron interactions, facilitated by the high density of accessible electronic states in narrow energy windows for these clusters. Similar behavior is observed for the Gd_2O triatomic anion, despite the anticipation of a simpler electronic structure from the half-filled 4f subshell on each Gd center. Herein, the anion photoelectron spectra of Gd_2O were collected with photon energies in the range of 2.033 to 3.495 eV, and various explanations for this interesting behavior are explored.