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Electron Paramagnetic Resonance Spectroscopic Studies of Cyanide-Bridged Fe/Os and Fe/Ru Clusters KATLYN MEIER, TANYA NOCERA, R. ABOOD, Allegheny College, Dept. of Physics, M. CHEN, Carnegie Mellon University, Dept. of Chemistry, M. HILFIGER, Texas A&M University, Dept. of Chemistry, D. PETASIS, Allegheny College, Dept. of Physics, C. ACHIM, Carnegie Mellon University, Dept. of Chemistry, K. DUNBAR, Texas A&M University, Dept. of Chemistry — The pentanuclear, cyanide-bridged metal clusters with the general formula {[M(tmphen)2]3[M'(CN)6]2} (tmphen = 3, 4, 7, 8-tetramethyl-1, 10-phenanthroline) have a core with trigonal bipyramidal geometry with equatorial [M(tmphen)2(CN)2] and axial [M'(CN)6] ions and contain M-CN-M' or M-NC-M' units, depending on the relative preference of the M and M' ions for the C or N terminus of the cyanide bridge. Spin-crossover behavior has been observed in these clusters and has motivated the current study. A series of Electron Paramagnetic Resonance (EPR) spectra of solid samples of the complexes with M/M'=Fe/Os and Fe/Ru were obtained between the temperatures of 2K and 300K. EPR spectra were also collected for samples dissolved in MeCN and MeOH. The EPR signals observed from Os (III) ions in the Fe/Os cluster and the signals from the Fe/Ru cluster indicating changes in oxidation and spin states of the metal ions as a function of temperature will be presented.

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