

## Understanding the Chemistry of the f Elements through Systematic Comparisons\*

R. G. Haire, Oak Ridge National Laboratory, CASD, Oak Ridge, TN 37831-6375

Located as islands between different rows of the transition elements in the periodic table, the f elements emerge as unique groupings of elements. In principle, the chemistry of each series should reflect a regular increase in the number of f electrons. If followed rigidly, homologs between each series would display similar chemical and physical properties. Significant exceptions exist, the most notable occurring with the early actinides and with the transcalifornium elements. Understanding the differences in the behavior and property of these elements can become more plausible by systematic comparisons, especially between actual electronic configurations and/or the f-electron promotion energies. The latter will be employed in discussing studies of the chemical and physical behavior of these f elements and their compounds, that emphasize behavior under pressure and at elevated temperatures. [\*Research sponsored by the Div. of Chemical Sciences, USDOE, under contract DEACO5-96OR22464 with Lockheed Martin Energy Research Corp.]