

[Abstract for presentation at the ACS National Meeting, August 22 - 26 1999, New Orleans, LA]

SPECTROSCOPIC STUDIES OF f-ELEMENTS IN SILICATES.*

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*Research sponsored by the Division of Chemical Sciences, Office of Basic Energy Sciences, U.S. Department of Energy, under contract DE-AC05-96OR22464 with Oak Ridge National Laboratory, managed by Lockheed Martin Energy Research Corp.

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Spectroscopy has been employed to probe important chemical properties of f-elements in silicate hosts, which have relevance to EMSP programs. We have examined the stability of oxidation states and the fundamental spectroscopy of these f-elements in both borosilicate and sol-gel matrices. With the borosilicate products, a general correlation was found between the oxidation states observed in the glass products with those in oxides formed at similar temperatures. Different oxidation states could be obtained with selected f-elements prepared via a sol-gel technique at room temperatures. Several important spectroscopic properties and bonding interactions of the f-elements in these matrices will be discussed.

*Research sponsored by the Chemical Sciences Div., BES, U.S. DOE, under contract DE-AC0596OR22464 with Lockheed Martin Energy Research Corp.