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**Lanthanide- and Actinide-Zirconia Based Materials:
Advanced Ceramics for Transmutation and Fuels**

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LANTHANIDE- AND ACTINIDE-ZIRCONIA-BASED MATERIALS:
ADVANCED CERAMICS FOR TRANSMUTATION AND FUELS

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We have investigated selected lanthanide (Ln) and actinide (An)zirconium oxide systems by X ray diffraction and Raman spectroscopy. The lanthanides (Ce, Nd, Sm) were studied both for their own properties, as well as being surrogates for actinides (e.g., Pu, Am, Cm, etc.). Both cubic stabilized zirconia and zirconia pyrochlore oxides (e.g., $\text{Ln}_2\text{Zr}_2\text{O}_7$) were pursued. Small fragments and pellets of the different materials have been prepared and characterized. The thermal conductivity of selected samples has also been measured at elevated temperatures using the LASER flash method. The results obtained, a comparison of the Ln and An zirconia systems and the potential applications for these materials will all be reported.