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The role of complex oxides towards decarbonizing the energy sector

SARAH C FINKELDEI[1], JESSICA GRANGER-JONES[1], JOHN M PROCTOR[1], LUCAS OPITZ[1], ARTAS A. MIGDISOV[2] AND FLORIE CAPORUSCIO[2]

[1]University of California, Irvine

[2]Los Alamos National Laboratory

Presenting Author: sfinkeld@uci.edu

The ongoing decarbonization efforts in the United States and world wide require a combination of various energy technologies with a low carbon foot print, including nuclear energy. A summary of recent progress in nuclear materials chemistry involved in the synthesis and performance of advanced nuclear fuels, as well as their disposal to increase the safety and efficiency of the nuclear energy sector will be presented. Utilization of wet-chemical, innovative synthesis approaches in combination with a wide range of characterization tools, facilitate a better understanding of the structure-property relationships of advanced nuclear fuel and its waste forms. Ongoing efforts at UCI are supported by the recently established cluster of nuclear chemistry laboratories in combination with the TRIGA reactor and characterization facilities and will be briefly introduced.