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The Crystal Structure of Lanthanide Zirconates RICHARD CLEMENTS, Bragg Insitute, ANSTO and School of Chemistry, The University of Sydney, BRENDAN KENNEDY, School of Chemistry, The University of Sydney, CHRISTOPHER LING, Bragg Institute, ANSTO and School of Chemistry, The University of Sydney, ANTON P.J. STAMPFL, Bragg Institute, ANSTO — The lanthanide zirconates of composition $Ln_2Zr_2O_7$ (Ln = La-Gd) are of interest for use in inert matrix fuels and nuclear wasteforms. The series undergoes a pyrochlore to fluorite phase transition as a function of the Ln atomic radii. The phase transition has been attributed to disordering of both the cation and the anion [1]. We have undertaken a synthesis of the lanthanide zirconate series $Ln_2Zr_2O_7$ (Ln = La-Gd), $Ln_{0.2}Zr_{0.8}O_{1.9}$ (Ln = Tb-Yb) and $Nd_xHo_{2-x}Zr_2O_7$ ($0<x<2$) via a solid state oxide technique. We have performed neutron powder diffraction on selections of the series, using ANSTO's new high resolution powder diffractometer Echidna, in order to obtain accurate data on atomic displacement parameters and O 48f position across the series. These results will be presented, along with details of the analysis and synthetic techniques used.

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