

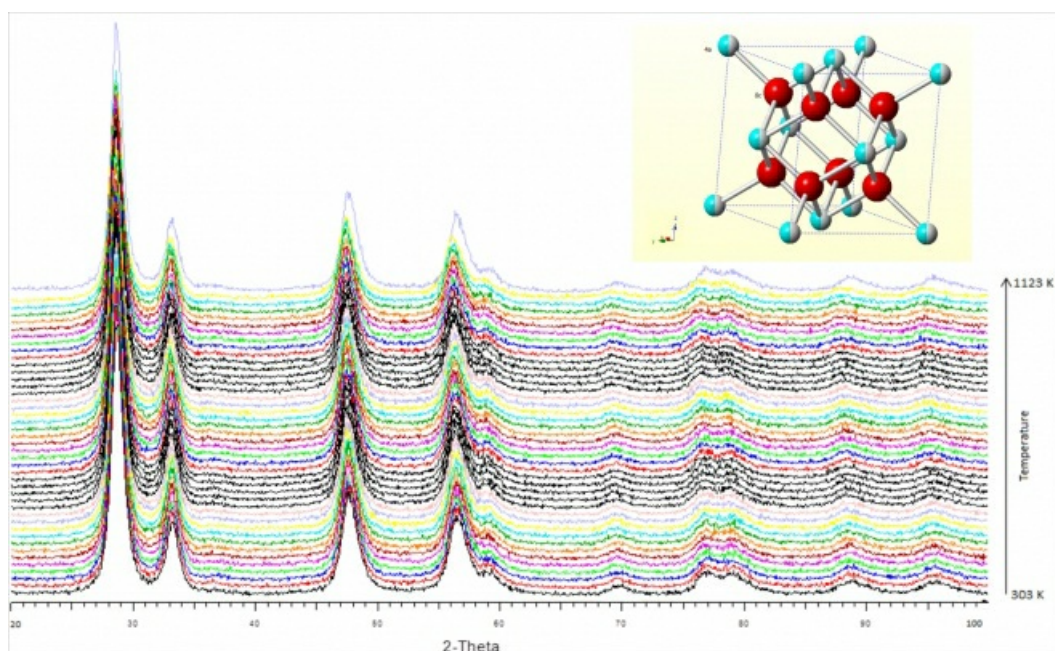
*Structure-property correlation: the Ionic conductivity of selected zirconates*

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Binary mixed metal oxides described by the chemical formula  $A_2B_2O_7$ , or  $A_2B_2O_6O'$  to highlight the uniqueness of one of the oxygen atoms, mostly adopts one of two major structure types, Pyrochlore or Defect Fluorite. Materials with both structure types have been investigated as electrolytes in solid oxide fuel cells (SOFCs) due to their ability to conduct ions and possibly low thermal expansion coefficients. Due to the need to improve performance temperatures many investigations into doped pyrochlores have been undertaken. Whittle et al. found that adding increasing concentrations of yttrium to a pyrochlore type zirconates makes the structure tend toward the fluorite structure. We report the results from our studies into the structure changes in materials of the form  $Ln_{2-x}Y_xZr_2O_7$  (where  $Ln = La$  and  $Sm$ ) using variable temperature PXRD and Rietveld refinements. The ionic conductivity of these solid solutions was also studied as a function of the composition, using electrochemical impedance spectroscopy.

[1] Whittle, K. R. et al. (2008) *J. Solid State Chem.* 182, 442-450

[2] van Dijk T. and Burggraaf A. J. (1980) *Phys. Stat. Sol.* 58, 115-125



**Keywords:** [Solid oxide fuel cell](#), [Ionic conductivity](#), [Rietveld refinement](#)