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[Enhanced Electrical Conductivity of Zirconia-Scandia with Niobia Addition](#)

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Resume : The electrical conductivity and the crystalline structure of zirconia-10 mol% scandia-x mol% niobia solid electrolytes were investigated for x=0.25, 0.50 and 1.00 mol%. Dense specimens with relative densities higher than 95% were obtained by solid state reaction and sintering at 1500°C for 5 h. Full stabilization of the cubic structure at room temperature was obtained for compositions with x=0.50 and 1.00, whereas for x=0.25 cubic and rhombohedral structures coexist. The electrical conductivity determined by impedance spectroscopy is of the same order of magnitude as that of the parent solid electrolyte (zirconia-10 mol% scandia) in the high temperature range (above 600°C). The isothermal conductivity of the solid electrolyte with x=0.50 mol% niobium oxide remains constant up to 100 h at 600°C.