

PREPARATION AND CHARACTERIZATION OF Ce_{0.8}Gd_{0.2}O_{1.9} SOLID ELECTROLYTE BY POLYMERIC PRECURSOR TECHNIQUES

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Ce_{0.8}Gd_{0.2}O_{1.9} solid ionic conductors have been prepared by several techniques involving polymeric precursors: the Pechini [1], the PVA [2], and the amorphous citrate [3] techniques. The aim of this work is to determine among these techniques the most suitable to obtain solid solutions with high chemical homogeneity and high sinterability. The main results show different paths for decomposition of the polymeric precursors. Calcined powders presented similar particle size distribution curves although they are related with the distribution of agglomerated particles. This result explains the difference in average particle size values calculated from results obtained by laser scattering and gas adsorption analyses. X-ray diffraction patterns show the main peaks of the cubic phase for calcinations at 600 °C. Agglomerate morphology is also quite different as observed by scanning electron microscopy. The PVA technique is the less complex route for solid solution synthesis. High densifications were obtained for powders prepared by the amorphous citrate technique.

[1] M. Pechini, US Patent 3,330,967 (1967). [2] S. K. Saha, A. Pathak, P. Pramanik, J. Mat. Sci. Lett. 14 (1995) 35. [3] P. Courty, B. Delmon, C. Marcilly, A. Sugier, Fr. Patent n° 1.604.707, 1968.

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