

Materials development for proton ceramic cells

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This study will be dedicated to the development of materials used in proton ceramic cells and more precisely to the ceramic electrolyte: optimization of the microstructure of the material via accurate monitoring of the synthesis and temperature treatment steps. The objective is to reach a total conductivity level above 0.1 mS/cm for operating temperatures below 600°C in order to prevent premature aging of SO cells performance. I will focus the presentation on BZCY solid solution showing properties which are compromise between the high proton conductivity of BCY and the stability of BZY. This material requires high sintering temperatures ($\approx 1600^\circ\text{C}$) and new sintering process are needed. One example will be presented, the cold sintering process (CSP) which enable to obtain dense BZCY type electrolyte and the influence of CSP parameters on ionic conductivity will be discussed.



Olivier JOUBERT (1965) is presently full professor in Chemistry of Materials at University of Nantes and is Chair of electrochemical storage and conversion of energy group (ST2E) of "Institut des Matériaux Jean Rouxel (CNRS-IMN)". The major research interests of professor JOUBERT revolve around development of new materials for technological applications such as high and intermediate temperature ceramic Solid Oxide (SO) fuel or electrolyser cells (SOFC and SOEC). He is co-author of 120 publications, 25 invited talks and 5 patents. Olivier Joubert is chairing the French Research Network on Hydrogen Energy which assembles all French academic research groups in the field of electrolysis production and storage of hydrogen and also its conversion to electricity using fuel cell.

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