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Aim of this research project is the study of electrolytes for solid oxide fuel cells. In particular, the main objective is to take into account advanced and recently discovered oxygen and proton conducting oxides; on some selected compounds we are going to carry out their preparation (by means of ceramic and wet chemistry methods) and start a thorough characterization of their structural and conductive properties. In particular, we are interested in the study of the structural features of these materials by means of advanced x-ray and neutron scattering techniques in order to correlate this piece of information to the conductivity properties. For example, we are studying the local structure of selected ionic conductors by means of pair distribution function analysis which reveals details about the short range order and help the comprehension of the conductivity pathways and mechanisms which play a role in the ion transport. Materials actually under study are: $\text{La}_2\text{Mo}_2\text{O}_9$, $\text{Ba}_2\text{In}_2\text{O}_5$ and $\text{La}_{1-x}\text{Sr}_x\text{BaO}_4$ oxygen ion conductors and Y-doped BaCeO_3 and BaZrO_3 and Ca-doped LaNbO_4 proton conductors.

References

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