Oxide-based Proton Conductors: a Diversity of Transport Properties

Dr. Nikolaos Bonanos

Energy Conversion and Storage, Technical University of Denmark

- **Jueves 29 de Octubre a las 14 horas**
- **Aula: RFP 3er piso DQIAQF/INQUIMAE**
- **Streaming por el canal de YouTube del DQIAyQF**

Resumen

Oxide-based proton conductors have been used to develop high-temperature electrochemical cells, including fuel cells, steam electrolysers, gas sensors and hydrogen membrane reactors. The protonic charge carriers derive from incorporated water vapour, resulting in these materials not really being pure proton conductors. Rather, they present a diversity of transport properties: protonic, oxide ion and electronic, usually p-type. While measurements of individual ionic transport numbers in these materials are relatively widespread, comprehensive studies of the oxide ion, protonic and electronic transport numbers in the same material are less common. In this talk, the techniques of transport measurement are described and published data on the transport numbers of perovskite proton conductors are reviewed. A graphical representation of these quantities is proposed based on the ternary plot. Finally, a recent controversy concerning hydroxyl ion conduction is briefly explained.