Ionic Conductors: Characterisation of Defect Structure

Prof. Isaac Abrahams

Queen Mary, University of London

Aims

This course introduces students to basic crystal structures and explains how presence of defects leads to materials that support high ionic conductivity. The concepts of crystal chemistry, the relationships between structures as well as methods of defect structure analysis are covered.

Learning Outcomes

By the end of this course students should be able to:

- Describe the most important inorganic crystal structures in terms of close packing of ions and explain the relationships between these structures.
- Describe the main types of defects that occur in crystalline solids, how these defects are formed and how they can move within the solid.
- Describe the main structures that act as hosts for fast ion conduction.
- Describe the main features of solid electrolytes, including cation and anion conducting systems and the main types of conduction mechanisms in these systems.
- Understand the different types of phase transitions that occur in solid electrolytes and the structure-property relationships in these systems.
- Carry out a basic defect structure analysis of a solid electrolyte using neutron diffraction data.

Lecture co-financed by the European Union in scope of the European Social Fund

HUMAN CAPITAL
HUMAN – BEST INVESTMENT!

EUROPEAN UNION
EUROPEAN
SOCIAL FUND