הטכניון - מכון טכנולוגי לישראל

TECHNION - ISRAEL INSTITUTE OF TECHNOLOGY

הפקולטה להנדסה כימית
ע"ש וולפסון
The Wolfson Department of Chemical Engineering

Wolfson Department of Chemical Engineering Seminar

Lecture Hall 6, Wolfson Department of Chemical Engineering,

Wednesday April 26 2017, at 1:30pm

Prof. Maria Luisa Di Vona

University of Rome Tor Vergata, Rome, Italy
International Associated Laboratory (L.I.A.), Ionomer Materials for Energy (Aix Marseille University, CNRS, University of Rome Tor Vergata) France/Italy

Cations vs Anions in Solid State Polymer Electrolytes

Ionic conducting polymers are very versatile materials used in several applications such as proton and anion exchange membrane fuel cells or redox-flow batteries. The membrane separator is a key material for commercialization of electrochemical energy technologies, because it determines the performance and its cost can be a major part of the whole system.
We have in recent years concentrated on improvement of aromatic ionic conductors introducing Van der Waals bonds (organic-inorganic hybrid composites) or covalent bonds (cross-links). In this presentation we will focus the attention on the comparison of the main parameters of the two classes of anion and cation exchange membranes based on aromatic polymers. Composite cation and anion electrolytes containing titanium dioxide with two model cases of functionalization as typical hydrophilic or hydrophobic surface modifiers will be presented. Finally, the influence of the aromatic backbone and the grafted ionic groups (sulfonic acid, sulfammonium and quaternary ammonium) on the membrane permeability will be discussed.

Selected references

IV Ferrari, M Braglia, T Djenizian, P Knauth, ML Di Vona *J Power Sources*, 353, 95-103 (2017)
P Knauth, L Pasquini, ML Di Vona *Solid State Ionics*, 300, 97-105 (2017)
L Pasquini, ML Di Vona, P Knauth *New J Chem*, 40, 3671-3676 (2016)
R Narducci, JF Chailan, A Fahs, L Pasquini, ML Di Vona, P Knauth *J Polym Sci Part B: Polym Phys*, 54, 1180-1187 (2016)
Narducci, ML Di Vona, P Knauth *J Memb Sci*, 465, 185-192 (2014)

Refreshments will be served at 13:15