

MSE-Colloquium@NTU

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Lecture Theatre 3, Nanyang Technological University



NAFION® - What is it? A tutorial approach

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About the Talk

Nafion® (Trademark of Dupont, USA, now Chemours) has been invented by Walter G. Grot* over more than 40 years ago. Nafion is a perfluorosulfonic acid polymer with exceptional properties, which is now utilized in many forms. The most important is the application as a separator in Chlor-Alkali Electrolysis. In addition, the Solid Polymer Electrolyte®-Technology SPE® (originally trademark of General Electric, USA) finds widespread application in fuel cells, water electrolyzers, capacitors, etc. Other Nafion products play a role in (bio)sensors, actuators, dehumidification systems, further in chemical catalysis, electrocatalyst characterization, etc. The presentation gives a tour d'horizon on Nafion, its synthesis, properties, and applications, also emphasizing implications for researchers, who utilize technical Nafion products in their work.

*W.G. Grot, Chem. Ing. Techn. 44, 163 (1972), Chem. Ing. Techn. 44, 167 (1972)

About the Speaker

Professor Günther G. Scherer studied Chemistry at the Technical University Munich (Diplom-Chemiker) and obtained a PhD in physical chemistry from the Technical University Berlin in 1975, while working with Prof. Heinz Gerischer and Prof. Frank Willig at the Fritz-Haber Institut of the Max-Planck-Gesellschaft. After a stay at the IBM Research Laboratory in San Jose, California, as an IBM World Trade Post-Doctoral Fellow (1976-1977), he joined the Battelle-Institut Frankfurt/M. (Dr. G. Sandstede) in 1978 with a scholarship of the German National Science Foundation, working on electrochemical oxygen reduction. In 1980, he moved on to the Brown Boveri Research Center, Baden, Switzerland, where he was involved in an R&D project on large scale water electrolysis, and from 1986 to 1989, he continued to work at Ingold Messtechnik (subsidiary of Mettler), Urdorf, Switzerland, heading a research group on electrochemical sensors. In 1989, Professor Scherer joined Paul Scherrer Institut, Villigen, Switzerland and started PSI's activity on Polymer Electrolyte Fuel Cells (PEFCs). In 2002, he became Head of the Electrochemistry Laboratory of Paul Scherrer Institut, being responsible for its fuel cell, battery, and supercap research until his retirement in 2011. During this time, he lectured at The Swiss Federal Institute of Technology (ETH) Zuerich. Professor Scherer joined TUM CREATE Singapore in 2013 as Senior Investigator (part time) and in 2014, he became Head of the Electrochemistry Laboratory. Professor G.G. Scherer has published extensively on fundamental and application aspects of polymer electrolyte fuel cells. For his work he was awarded the Christian Friedrich Schönbein "Medal of Honor" (2009) and the Christian Friedrich Schönbein "Contribution to Science Medal" (2005, to Scherer Group) of the European Fuel Cell Forum. He has guided numerous national and international projects with academic and industrial partners and served on many advisory boards. In 2014, he was named Adjunct Professor at ERI@N.