Grand Technion Energy Program
תוכנית האנרגיה ע"ש גרנד

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

Technion
Israel Institute of Technology

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Prof. Bouwmeester graduated *cum laude,* and earned his Ph.D. degree in the field of solid-state electrochemistry both from the University of Groningen, The Netherlands. For a period of three years he was involved in industrial research towards the development of ion sensitive field effect transistors (ISFETs) for medical applications at Sentron V.O.F., in the Netherlands. He joined the Inorganic Materials Science group at the University of Twente in 1988. From 2011 until 2015 he served as councillor for the International Society for Solid State Ionics (ISSI). In 2012, he was appointed as a part-time professor at the University of Science and Technology (USTC) in Hefei, China. Prof. Bouwmeester is co-editor of CRC's Handbook of Solid State Electrochemistry. His research interests include solid-state thermodynamics and electrochemistry, and are primarily directed towards the use of oxide ion and mixed ionic-electronic conductors for devices such as oxygen separation membranes and solid oxide fuel cells. In these fields, he authored and co-authored several book chapters and more than 150 research papers.

Will lecture on:

Oxygen surface exchange kinetics of solid oxide ion conductors.

Oxygen surface exchange and diffusion are the key processes that control the performance of solid oxide fuel cells, electrolysers, oxygen separation membranes, gas sensors, etc. Though diffusion of oxygen ions in solid oxide elelctrolytes and in oxides with mobile ionic and electronic carriers, so-called mixed conductors, has been well characterized, below a critical length scale the surface exchange reaction between gaseous oxygen and oxygen from the oxide governs overall oxygen transport. At present, however, the lack of fundamental understanding of oxygen surface exchange hampers further development trends towards lower operation temperatures and potential application of the materials in micro-devices. Several methods are available for studying of the surface exchange reaction, among which electrical conductivity relaxation and ^{18}O-^{16}O isotopic exchange. The paper presents theory and background of both methods. Data from measurements on different solid oxide electrolytes and mixed conductors are presented.

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