

Plenary Speaker, 0900

Wednesday, March 24th

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Title:

Membrane Pore Characterization Techniques - Status Quo and Future Development

Abstract:

A review of pore size, pore size distribution and morphology characterization techniques of filtration membranes will be presented. Most of the current available techniques can provide "bulk" pore properties in the filtration membranes only and could not provide "depth" profile of the pore properties and/or three-dimensional pore structure in the multilayer filtration membranes. The presentation will be divided into two parts: in the first part, a brief review of the current methods for characterizing filtration membrane pore properties will be given; in the second part, some innovative methods can give "depth profile" properties of pore and free volume in filtration membranes from micron-scale to angstrom will be introduced. Two of those innovative methods, nano-transmission x-ray microscope (NTXM) and position annihilation lifetime spectroscopic (PALS) techniques will be illustrated thoroughly with examples of microfiltration and nanofiltration membranes.

Kuo-Lun Tung

Kuo-Lun (Allan) Tung, Director of the R&D Centre for Membrane Technology (CMT) at Chung Yuan University in Taipei, Taiwan, was elected as a member of the Council in 2008 with a speciality of research and development on membrane filtration applications for 18 years. It's good to see that the Society is enthusiastic about membrane filtration technology.

Allan Tung was born in 1968 in Taipei, Taiwan. He received the B.S., M.S. and Ph.D. degrees in 1991, 1994 and 1998, respectively, from the National Taiwan University, all in chemical engineering. After post-doctoral research work for one year at National Taiwan University, he joined Chung Yuan University in 1999, where he is currently a Full Professor in the department of chemical engineering. He is one of the founding members of the CMT since 2000 and was elected to serve as deputy director and director in 2006 and 2009, respectively. The CMT is

aimed at promoting the development of membrane technology, excelling academic exchange and enhancing cooperation with the industrial sector.

With a solid training background of filtration theory since 1990, Allan Tung has been doing research in the area of membrane filtrations for more than 18 years with a strong research interest in the fundamental study of membrane fouling and applications on downstream processing for bioseparation and water/wastewater treatments using experimental and computational methods. Recent research topics include fundamental researches of membrane fouling and filtration mechanism of deformable particle, CFD analysis of fluid flow through textile filter media and porous membranes, molecular dynamic study of transport phenomena in membranes, computer simulation of multi-phase flow and membrane module design for water/wastewater treatments. Some of the developed patented technologies, say feed spacer design technology for spiral wound membrane module, have been transfer to industries.

Allan is also active in the international affairs in membrane filtration discipline. He is now a council member of The Filtration Society in UK and also serving as the deputy secretary/managing committee member of the membrane technology specialist group in international water association (IWA), Taiwan representative Secretary of Asia Pacific Desalination Association (APDA), Taiwan deputy representative of Taiwan, International Delegates on Filtration (INDEFI), and executive committee member of International Recycling Society (IRS).