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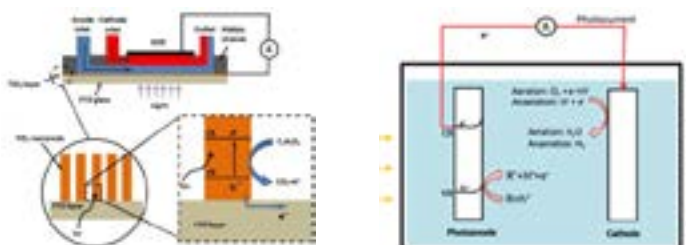
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Photocatalytic fuel cell for wastewater treatment and recovery of energy resources

Photocatalytic fuel cell (PFC) is primarily a synergistic integration of two emerging technologies, namely, photocatalysis (PC) and fuel cell (FC). Solar PC can decompose organic compounds while FC provides an electrical potential gradient to facilitate transport of electrons. Therefore, PFC can be effectively applied to utilize solar energy for wastewater treatment and recovery of energy chemically stored in wastewater. It is a promising technology for solving both environmental and energy problems. In order to conduct proper research for rapid development of PFC, we need to have good knowledge about the material properties and clearly understand the cell mechanisms of PFC. The Fermi level between the photoanode and the cathode forms interior bias that inhibits recombination of photogenerated electrons and holes, resulting in increase in visible-light activation of PFC. Modification of photoelectrocatalysts and use of microfluidics are effective strategies for improving the PFC performance. The PFC effects can also be manipulated by the system configuration, design and control for specific outputs and reaction rates. The speaker will present the fundamentals, latest development of PFC and upcoming R&D challenges needed for enhancing the PFC technology.

**Biography**

Michael K H Leung is a Professor and Associate Dean in the School of Energy and Environment at the City University of Hong Kong, Hong Kong. He is also the Director of Ability R&D Energy Research Centre at University of Hong Kong. His areas of expertise include solar photocatalysis, fuel-cell electrochemistry and advanced refrigeration and air-conditioning. He is listed as a highly cited scholar in energy science and engineering by Shanghai Ranking and Elsevier. He has published 130+ journal papers, 70+ conference papers, 15 books/book chapters and 6 patents. He is also a Past Chairman of the Energy Institute (Hong Kong Branch), Chairman in HKIE Education and Examinations Committee, a Chartered Engineer and a Registered Professional Engineer.

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