Beyond Oil and Gas: The Methanol Economy

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Methanol is much preferable to hydrogen for energy storage and transportation. It is also an excellent fuel for heat engines and fuel cells and a convenient raw material for synthetic hydrocarbons and their varied products. Methanol, presently produced from fossil fuel based syn-gas, can also be made by direct oxidative conversion of natural gas or other methane sources. Even biomass can be converted to methanol through syn-gas. Chemical recycling of excess carbon dioxide formed from human activities, natural and industrial sources, or even from the air to methanol via capture followed by reductive conversion with hydrogen is possible. Any available energy source (preferably alternative and atomic energy) can provide the needed energy, primarily generating hydrogen. Direct electrochemical reduction of CO_2 is also possible. The lecture will also cover some of our studies on direct oxidation methanol fuel cell.

Short Biographical Sketch

Professor G. K. Surya Prakash, Ph.D., was born in 1953 in Bangalore, India. He earned a B.Sc (Hons) in chemistry from Bangalore University and an M.S. in chemistry from the Indian Institute of Technology, Madras. Prakash came to US in 1974 and joined Professor George Olah's group at Case Western Reserve University, Cleveland, Ohio to pursue graduate work. He moved with Professor Olah to the University of Southern California (USC) in 1977 to help establish the Loker Hydrocarbon Research Institute and obtained his Ph.D. in physical organic chemistry at USC in 1978. He joined the faculty of USC in 1981 and he is currently a Professor and the holder of the George A. and Judith A. Olah Nobel Laureate Chair in Hydrocarbon Chemistry at the Loker Hydrocarbon Research Institute and Department of Chemistry. He also serves as the Scientific Co-Director of the Institute. His primary research interests are in superacid, hydrocarbon, synthetic organic & organofluorine chemistry, with particular emphasis in the areas of energy and catalysis. He is a co-inventor of the proton exchange membrane based direct oxidation methanol fuel cell. Professor Prakash is a prolific author with more than 570 peer-reviewed scientific papers and holds 22 patents. He has also co-authored or edited 8 books. He has received many awards and accolades including two American Chemical Society National Awards: 2004 for his achievements in the area of fluorine chemistry and 2006 for his contributions to hydrocarbon chemistry. More recently, he has received the 2006 Richard C. Tolman Award from the Southern California section of the American Chemical Society for his scientific contributions to Southern California and the 2007 Distinguished Alumni Award from his *alma mater*, Indian Institute of Technology, Madras, India. He is a fellow of the American Association of Advancement of Science and a Member of the European Academy of Arts, Sciences and Humanities. He also sits on several Editorial Boards of Chemical Journals.