

CCST Seminar:

- ▶ Wednesday, April 15, 2009
- ▶ 11:00 A.M.
- ▶ 366 Colburn Laboratory

Dr. Robert J. Farrauto

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Dr. Farrauto received his B.S. in chemistry from Manhattan College (1964) and his Ph.D. from Rensselaer Polytechnic Institute (1968). Dr. Farrauto is a research fellow at the Corporate Research Laboratories of BASF Catalysts (formerly Engelhard) and currently manages a research team developing new catalyst technology for the hydrogen economy including hydrogen refueling stations and fuel cells for stationary, portable power and vehicular applications. As an adjunct professor in the Earth and Environmental Engineering Department of Columbia University, he teaches courses and supervises research in catalysis. among other awards, Dr. Farrauto received the Ciapetta Lectureship Award for 2008 from The North American Catalysis Society and the Catalysis and Reaction Engineering Award from AIChE in 2005.

“Catalysis for the 21st Century: The Convergence of Energy & the Environment”

The application of oxidation catalysts for control of emissions from gasoline vehicles began in 1975. By 1980 the modern three-way catalyst (TWC) was introduced in the U.S. and remains the essential technology for abating CO, hydrocarbons (HC) and NO_x emissions worldwide. In the U.S. the TWC catalyst functions for at least 150,000 miles meeting EPA emission standards. In the mid-1990's diesel oxidation catalysts were introduced into diesel trucks and passenger cars designed to reduce a portion of the liquid particulate emissions, CO and HC. Today the vehicle manufacturers are researching new and improved catalysts to further reduce diesel emissions and by 2010 will face a formidable challenge of further reducing emissions to practically zero with catalyst lifetimes approaching 430,000 miles. The world is now beginning to address renewable sources of energy to replace fossil fuels that will satisfy our energy needs while maintaining the environment. Solar, wind, geothermal and even nuclear energy should be high priorities; however, it is not likely they will be sufficiently mature to meet all of our requirements in a timely manner. Furthermore, the use of food crops, such as corn kernels for alcohol fuels, is not sustainable. We are also approaching a hydrogen economy and can expect the emergence of portable power and residential fuel cell systems within the next year or two. The ultimate goal is to produce a hydrogen fuel cell vehicle projected for 2015 and beyond. The processing of non-edible plants (ligno-cellulose), landfills, and other waste streams are being explored to meet the clean energy challenges of the 21st century. The common denominator for these technologies will be the use of heterogeneous catalysts. Just as catalysts assisted in solving the automobile emission problem, they will once again be at the forefront in the development of sustainable and environmentally sound energy solutions. This talk will highlight some of these technologies.