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Wednesday, April 20th, 2022 at 4:00pm EST
Virtual Meeting: Zoom

Dr. C. Y. Chen



Principal Scientist
Catalysis Technology
Chevron Energy Technology Company

Catalysis-Adsorption Studies on Zeolites and Upgrading Biological Feedstocks to Renewable Fuels and Lubricant Base Oils via Novel Hydroprocessing

This seminar will be presented on two subjects. The first part discusses catalysis and adsorption studies on zeolites and the second part reports upgrade of biological feedstocks to renewable fuels and lubricant base oils via novel hydroprocessing.

The widespread use of zeolites as catalysts, adsorbents and ion exchangers has had a remarkable impact on many industrial processes. The use of organic structure directing agents has led to the discovery of many novel zeolites in recent years, making breakthroughs in zeolite synthesis and providing an impetus in developing new or improved process chemistry. The understanding of zeolite structures and structure-property relationships is one of the most critical tasks in bringing the industrial applications of these materials to commercial fruition. Here I will

first present a brief overview of Chevron's zeolite R&D. Then the emphasis will be placed on catalytic test reactions and vapor phase hydrocarbon physisorption as two important techniques in our R&D for finding these applications. The pore sizes of zeolites reported based on the crystallographic data often provide only guidance when selecting zeolites for certain applications. The final choice of zeolites depends on their effective pore sizes/volumes and other properties determined by catalytic test reactions and adsorption. Moreover, these two techniques provide an effective tool for monitoring the quality of the zeolites, their extrudate bases and catalysts during their commercial production.

Affordable, reliable and ever-cleaner energy is essential to achieving a more prosperous and sustainable world. As the petroleum resources are depleting, we have been looking into renewable/sustainable raw materials - the biological resources - to replace petroleum-based materials in the processes for manufacturing the products in demand. The biological resources such as lipids (vegetable oil and animal fat) have very different compositions and properties in comparison to petroleum. Therefore, new catalytic processes are desirable for directly converting such biological feedstocks to renewable gasoline, jet, diesel fuels and base oils. Here I will report our novel hydroprocessing in this area. Furthermore, the new role of alkane disproportionation in improving the properties of renewable fuel products will be discussed.

Speaker Bio

C.Y. Chen is a principal scientist in Chevron's Catalysis Technology Department located in Richmond, California. He was also a technical team leader of Chevron's zeolite synthesis group. He is a zeolite scientist by training and has been working at Chevron for the past 27 years in zeolite R&D covering synthesis, characterization, catalysis, adsorption and commercialization. He received his Diplom in Chemical Engineering from the University of Karlsruhe and Ph.D. in Chemistry from the University of Oldenburg, both in Germany with Prof. Jens Weitkamp, after which he was a postdoc with Prof. Mark Davis at Virginia Tech and Caltech. He has been an adjunct professor in the Department of Chemical Engineering of UC Davis since 2012. He is the recipient of the 2020 *F.G. Ciapetta Lectureship in Catalysis* award of the North American Catalysis Society.

Please refer to email announcement for login details.

Presentation 4:00 PM Annual Membership Dues \$35 (*Students* = \$15)

Deadline for reservations is 4:00PM Monday, April 18th, 2022

To make your reservation, fill out the [online form](#).
