

Gabor A. Somorjai Award For Creative Research In Catalysis

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Iglesia

Credit: Michael Barnes/UC Berkeley

Enrique Iglesia, 57, has developed new paradigms for catalytic materials and processes, according to his colleagues. Currently the Theodore Vermeulen Professor in the department of chemical and biomolecular engineering at the University of California, Berkeley, he is also director of the Berkeley Catalysis Center.

“Iglesia’s impressive statistics on publications, patents, and citations, together with the recognition and appreciation of the catalytic and engineering communities, are not surprising if one considers the breadth and relevance of his work, together with the outstanding depth with which he studies scientific problems,” one colleague says.

Iglesia’s research group addresses the design, synthesis, and structural and mechanistic characterization of inorganic solids. These materials are useful as catalysts for reactions important in energy conversion, petrochemical synthesis, and environmental protection. His recent work has led to the development of novel materials and catalytic chemistries for the formation of C–C bonds from oxygenate precursors via homologation routes on acid catalysts and aldol condensation on metal clusters.

Through his work, Iglesia has advanced the understanding of catalytic site requirements and reaction pathways. Often by looking at the effects of size and composition, he has explored systems including oxide nanoclusters used as oxidation and acid catalysts, methane re-forming and combustion on small metal clusters, and dispersed binary oxides as catalysts for oxidation reactions.

Among his most recognized work is that on transition-state selectivity in CO insertion and alkane activation. He discovered the origin of the broad range of carbonylation and alkane activation reactivities

that prevail among acid sites located within different environments inside a given zeolite. These findings allow the design of microporous solids by locating acid sites within specific voids with predictable consequences for catalytic rates and selectivities. This unprecedented selectivity and the stability of these materials have provided an attractive, practical, and cleaner alternative to current methanol carbonylation processes.

Iglesia's contributions have come during a career that has spanned both industry and academia. Born in Havana, Cuba, he received a B.S. degree in chemical engineering from Princeton University. From there he moved to Stanford University, where he completed a doctorate in chemical engineering.

After 10 years working in corporate research at Exxon Research & Engineering, he moved to UC Berkeley in 1993. In addition to serving on the chemical engineering faculty there, Iglesia is a faculty senior scientist in the Chemical Sciences Division at the Department of Energy's Lawrence Berkeley National Laboratory.

Iglesia has coauthored nearly 300 publications and 40 U.S. patents. Along with extensive lectureships, editorial activities, and service to professional societies, his recent recognitions include an Alexander von Humboldt Senior Scientist Award in 2007, ACS's George A. Olah Award in Hydrocarbon or Petroleum Chemistry in 2005, and the Alpha Chi Sigma Award for Chemical Engineering Research from the American Institute of Chemical Engineers. He was elected to the National Academy of Engineering in 2008 and as an ACS Fellow in 2010. In 2009, he was named the first recipient of the Tanabe Prize for Acid-Base Catalysis.

Iglesia will present the award address before the ACS Division of Catalysis Science & Technology.

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