

Iron Complexes for the Reversible Hydrogenation of CO₂ to Formic Acid or Methanol

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11 de Febrero de 2019
12:00

Sala de Grados de la Facultad de Ciencias

CICLO CONFERENCIAS ISQCH 2019

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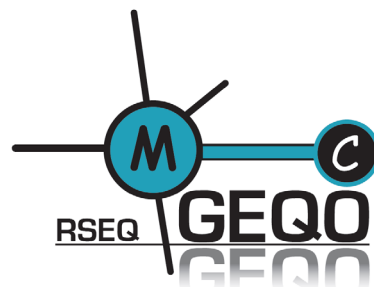
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Iron complexes for the reversible hydrogenation of carbon dioxide to formic acid or methanol

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Given the steady decline in the world's fossil fuel reserves and the potential environmental consequences of continued fossil fuel use, there is considerable interest in the utilization of alternative carbon sources. Carbon dioxide is a particularly attractive feedstock owing to its high abundance, low cost and toxicity, and relative ease of transport. Formic acid and methanol are especially promising targets for the catalytic conversion of carbon dioxide. Both are valuable commodity chemicals, which are synthesized on a large scale, and could also be used as materials for chemical hydrogen storage. In this presentation the development of a series of pincer supported iron complexes for the catalytic hydrogenation of carbon dioxide to formic acid and methanol and the dehydrogenation of formic acid and methanol will be described. The important role that Lewis Acids play in facilitating this process will be discussed, as well as the results of fundamental mechanistic studies to elucidate the factors that are important in determining the rates of the elementary steps in catalysis.



Nilay HAZARI was born in Suva, Fiji and spent the first 17 years of his life in Melbourne, Australia. After that he moved to Sydney where he received a B.Sc (2002) and an M.Sc (2003) from the University of Sydney working with Professor Leslie D Field. He completed a D.Phil (2006) as a Rhodes Scholar at the University of Oxford under the supervision of Professor Jennifer C Green and then worked for three years as a postdoctoral scholar with Professors John E Bercaw and Jay A Labinger at the California Institute of Technology. Nilay began as an Assistant Professor of Chemistry at Yale University in July 2009 and is currently a Professor of Chemistry.