



Innovative Heterogeneous Catalysis Unit

Overview

The Innovative Heterogeneous Catalysis Unit aims to develop and commercialize innovative catalysts that surpass existing concepts. Catalysts are used to accelerate chemical reactions when synthesizing compounds from ingredients, and have supported industrialization in the form of food and petrochemical production. Still, new catalysts must be developed and improved to preserve natural and other scarce resources, and to prevent environmental pollution. The unit sets the goal of developing and realizing mass production of environmentally friendly solid catalysts.

Research goals

To replace petroleum as an ingredient in a broad range of products, the Innovative Heterogeneous Catalysis Unit aims to develop catalyst technology capable of producing glucose from organic resources made from biomass such as weeds, waste wood, and inedible parts of plants, and converting the glucose to a wide range of chemical resources. The unit aims to secure resources that serve as alternatives to petroleum while reducing CO₂ emissions. In addition, the Innovative Heterogeneous Catalysis Unit also works on improving the efficiency and commercialization of new electrified catalysts produced from ammonia, catalysts discovered in joint research with Professor Hideo Hosono at the Materials Research Center for Element Strategy. These new catalysts can be produced at atmospheric pressures and temperatures lower than those required for the Haber-Bosch process. Requiring only half the energy compared to conventional methods, the unit is looking to implement downsized plants for electrified catalysts in ammonia synthesis that can be operated in developing countries and countries without adequate infrastructure. The Innovative Heterogeneous Catalysis Unit is also promoting the development of new solid catalysts and research to clarify their mechanisms.



Research Unit Leader **Michikazu Hara**

Profile

- 2016 Professor, Institute of Innovative Research, Tokyo Institute of Technology
- 2006 Professor, Materials and Structures Laboratory, Tokyo Institute of Technology
- 2000 Associate Professor, Chemical Resources Laboratory, Tokyo Institute of Technology
- 1999 Postdoctoral fellow, Pennsylvania State University
- 1995 Assistant Professor, Chemical Resources Laboratory, Tokyo Institute of Technology
- 1992 Corporate Research and Development Center, Toshiba
- 1992 Doctor of Science, Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology

