

Plasma Catalysis for Power to X

Hyun-Ha KIM

National Institute of Industrial Science and Technology (AIST)

Interactions at the interface of the plasma and catalyst surface have the potential to open new chemical pathways that have never been realized with conventional plasma alone or conventional thermal catalytic processes. Plasma catalysis is now facing a rapid growth phase for various applications such as pollution control, CO₂ hydrogenation, dry reforming, and ammonia synthesis. To achieve carbon neutral by 2050, renewable energy friendly chemical process should be developed. Plasma catalysis is gathering attention as chemical process for power-to-X (X = hydrogen, CH₄, methanol, formic acid, ammonia, etc) capable of converting CO₂ to value-added products, or ammonia synthesis. In this presentation, currently ongoing work on CO₂ hydrogenation to methane will be discussed. Ammonia production over Ru-Mg/alumina catalyst at 1 atm will be also presented.