Hydrogenation of \( \text{CO}_2 \) to formic acid by heterogeneous iridium catalyst immobilized on CTF

Kwangho Park, Gunasekar Gunniya Hariyanandam, Gyoosoon Park, Sungho Yoon*

The department of chemistry, Kookmin university, 861-1 jeongneung-dong, seongbuk-gu, Seoul 136-702, Republic of korea

Hydrogenation of \( \text{CO}_2 \) has received significant interests due to the fact that it could use carbon dioxide, known as not only greenhouse gas but also a non-toxic, abundant and renewable C1 building block, to produce formic acid. It could be an alternative for the present industrial production of formic acid. Although Rh-, Ir- and Ru-based organometallic catalysts are the best candidates for hydrogenation of \( \text{CO}_2 \) in homogeneous system, they have severe disadvantages as they could decompose the product upon releasing the pressure and heating in product separation step. To overcome this drawback, heterogeneous catalyst is the most attractive choice. Immobilization of catalyst on the nanostructure such as silica or resin has been a major way to make heterogeneous catalytic systems. However, low catalytic activity and metal contents of heterogeneous systems render chemists to find new class of catalytic support for better efficiency and improved yield of formic acid.

In this work, new type of heterogeneous Ir catalyst was fabricated using covalent triazine-based framework as catalyst support and analyzed by various spectroscopic methods. In addition, catalytic activities and reusability of the catalyst have been examined at high-pressure of \( \text{CO}_2 \) and \( \text{H}_2 \) conditions for the producing formic acid. Details will be presented at conference.

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