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New Iridium catalysts for the efficient base-free dehydrogenation of Formic Acid

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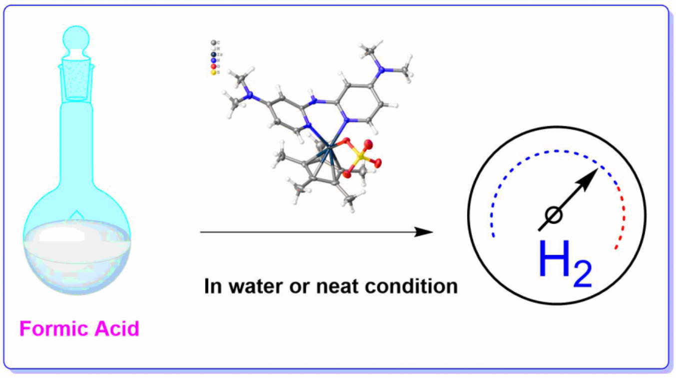
PURPOSE OF THE ABSTRACT

Hydrogen is expected to become an essential source of energy for future generations but some issues related to large-scale utilization of this energy vector remain to be solved. Even more importantly, dihydrogen is necessary for the production of electricity using fuel cells.[1] However, a hydrogen-based economy requires technology that allows efficient and safe storage and release of H2. In this light, the reversible storage of dihydrogen in the form of formic acid (FA, HCOOH) provides an interesting H2 storage-release system, which has been extensively studied in the past few years.[2] Formic acid can be obtained from the catalytic hydrogenation of CO2 [3] or by direct hydrothermal oxidation of biomass.[4] For practical application, the dehydrogenation of FA in water without bases or additives is highly preferable. We have prepared a series of efficient iridium catalysts bearing dipyridylamine (DPA) ligand for selective H2 production from formic acid affording high TOFs.

FIGURES



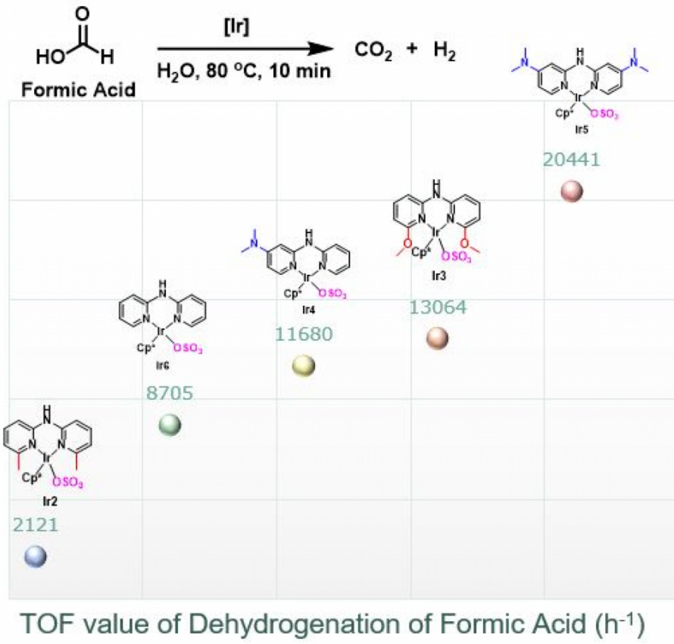


FIGURE 1

Dehydrogenation of formic acid

Homogeneous Iridium catalysts for the dehydrogenation of formic acid

FIGURE 2

Dehydrogenation of Formic acid

A series of Iridium catalysts for formic acid dehydrogenation with high TOFs.

KEYWORDS

Iridium catalysts | dehydrogenation | Formic Acid

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