

# **C0<sub>2</sub> and formic acid, a winning couple in reduction chemistry**

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► **To cite this version:**

Thibault Cantat. C0<sub>2</sub> and formic acid, a winning couple in reduction chemistry. 253rd ACS meeting, Apr 2017, San Francisco, United States. cea-02341704

**HAL Id: cea-02341704**

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Submitted on 31 Oct 2019

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# INOR: Division of Inorganic Chemistry

## 102 - CO<sub>2</sub> and formic acid, a winning couple in reduction chemistry

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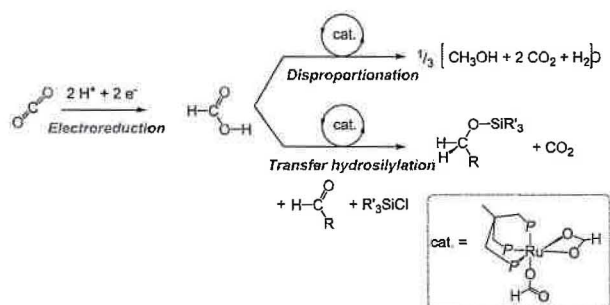
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Abstract:

Because it is abundant, inexpensive, low-toxic and renewable, CO<sub>2</sub> is an attractive carbon feedstock and its conversion has motivated recent efforts both in the academia and in the industry. Nonetheless, major advances are still hampered by the kinetic inertness of CO<sub>2</sub> and efficient catalysts are still to be needed to promote the reduction of CO<sub>2</sub> to reduced products, such as methanol.

We have recently shown that formic acid (HCOOH), obtained from the 2-electron reduction of CO<sub>2</sub>, can serve as an efficient C-H bond shuttle and reductant in the reduction of CO<sub>2</sub> to methanol. Using ruthenium(II) complexes, supported by a triphosphine ligand, formic acid can undergo a disproportionation reaction to methanol in high yields. In the presence of chlorosilanes, the same catalytic system is able to facilitate the reduction of aldehydes and CO<sub>2</sub>, exemplifying the role of formoxysilane in transfer hydrosilylation chemistry for the first time.



Utilization of formic acid as a C-H bond shuttle in disproportionation and transfer hydrosilylation reactions

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