

# Fe BASED MOLECULAR CATALYSTS FOR CO<sub>2</sub> CATALYTIC REDUCTION

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One of the most promising ways to address the recycling of CO<sub>2</sub> is through photo-assisted catalysis that transforms CO<sub>2</sub> into value-added chemical compounds. Among the highly efficient and selective molecular catalysts for the photocatalytic reduction of CO<sub>2</sub>, Fe(II) polypyridine catalysts have gained attention [1,2]. Notably, Fe(II) quinquepyridine (Figure 1) has demonstrated remarkable efficiency and robustness in the photocatalytic reduction of CO<sub>2</sub> into CO [1]. In an aqueous acetonitrile solution (1:1), this catalyst has achieved impressive turnover numbers (TON) exceeding 14,095 and exhibited a selectivity of 98%. Starting from these initial observations, we have been investigating in depth the electrochemical catalytic process and mechanisms of the Fe(II) quinquepyridine, which have received little attention so far. We will present our research on the main results and mechanisms regarding the catalytic reduction of CO<sub>2</sub> using Fe(II) quinquepyridine.

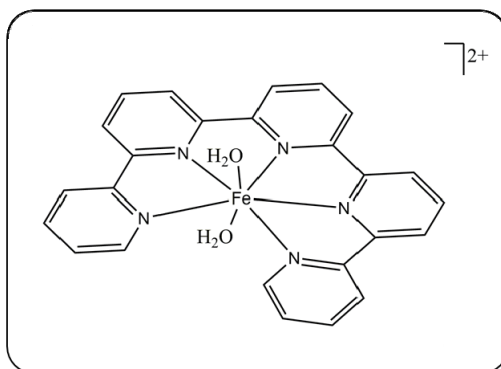


Figure 1. Structure of Fe(II) quinquepyridine catalyst.

[1] Y. Qin, L. Chen, G. Chen, Z. Guo, L. Wang, H. Fan, M. Robert, T-C. Lau, Chem. Commun., 2020,56, 6249-6252

[2] Z. Guo, S. Cheng, C. Cometto, E. Anxolabéhère-Mallart, S-M. Ng, C-C. Ko, G. Liu, L. Chen, M. Robert, T-C. Lau, J. Am. Chem. Soc. 2016, 138, 30, 9413-9416