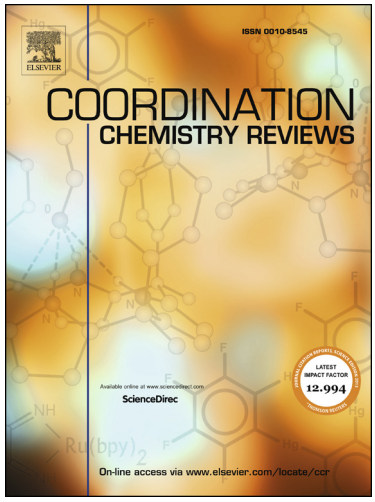

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Molecular Catalysis of the Electrochemical and Photochemical Reduction of CO_2 with Fe and Co Metal Based Complexes. Recent Advances.

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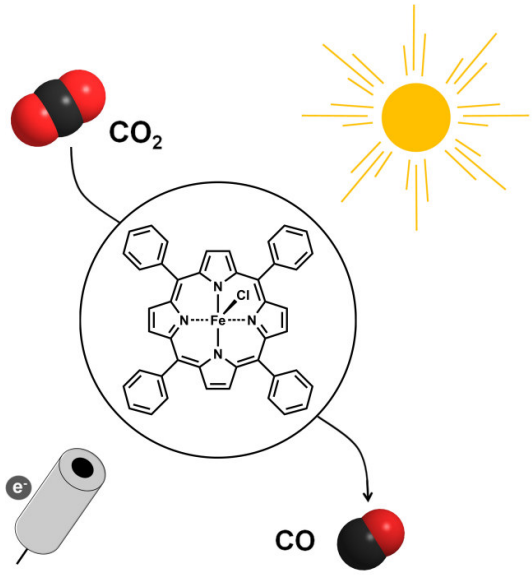
Graphical abstract



Keywords (max 6)

CO_2 reduction; iron porphyrins; molecular catalysis; electrochemistry; photochemistry; solar fuels

Abbreviations

TON, turnover number; TOF, turnover frequency; CS, catalytic selectivity; CV, cyclic voltammetry; SHE, standard hydrogen electrode; FE, faradaic efficiency; PS, photosensitizer; SD, sacrificial electron donor; *PS, photosensitizer excited state; $PS^{\bullet-}$, photosensitizer reduced form; $SD^{\bullet+}$, sacrificial electron donor oxidized form; LMCT, ligand-to-metal-charge-transfer; ACN, acetonitrile; DMF, dimethylformamide; TEA, triethylamine; TFE, 2,2,2-trifluoroethanol; HF, hydrofluoric acid; $^{t}Bu_4NPF_6$, tetrabutylammonium hexafluorophosphate; PhOH, phenol; FeTPP, iron(III) 5,10,15,20-tetraphenylporphyrin chloride; CAT, iron(III) 5,10,15,20-tetrakis(2',6'-dihydroxyphenyl)porphyrin chloride; FCAT, iron(III) 5,15-bis(2',6'-dihydroxyphenyl)-10,20-bis(pentafluorophenyl)porphyrin chloride; WSCAT, iron(III) 5,10,15,20-tetra(4′-N,N,N-trimethylanilinium)porphyrin chloride; ppy, 2-phenylpyridine; N5 ligand, 2,13-dimethyl-3,6,9,12,18-pentaazabicyclo[12.3.1]octadeca-1(18),2,12,14,16-pentaene; GC, gas chromatography; SC, semi-conductor/semi-conducting.