Visible light driven CO_2 reduction with Fe and Co complexes combined to semi-conductive materials

Marc Robert

Laboratoire Electrochimie Moléculaire - UMR CNRS 7591, Université Paris Diderot, Sorbonne Paris Cité, 15 rue Jean de Baïf, 75013 Paris

Recent attention aroused by the reduction of carbon dioxide has as main objective the production of useful organic compounds and fuels – *renewable fuels* – in which solar energy would be stored. Molecular catalysts can be employed to reach this goal. One route consists in first converting sunlight energy into electricity that could be further used to reduce CO_2 electrochemically.[1-2] Another approach is to directly use the visible photons and photo-stimulate the electrochemical reduction of the gas in the presence of an appropriate sensitizer.[3-4]

Molecular catalysts may provide excellent selectivity but usually with less durability and more complex processability than solid materials. Hybrid systems in which a robust molecular catalyst is associated to a conductive or semi-conductive material may combine the advantages of both homogeneous and heterogeneous catalysis [5-6].
Our recent results will be discussed, illustrating the rich potential of molecular catalysts to generate fuels from CO_2.

Keywords: Artificial photosynthesis, CO_2 catalysis, semi-conductive carbon materials

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