

Molecular catalysis for chemical energy conversion

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Abstract:

The depletion of fossil fuels and the global climate change linked to the anthropogenic emission of carbon dioxide have prompted scientists to secure renewable sources of energy. The conversion of solar energy to produce fuels such as hydrogen and methanol, using earth abundant materials (water and carbon dioxide) as feedstock by artificial photosynthetic process has been considered a promising models. In this seminar, the application of such process for photo-reduction and oxidation of water, as well as electrochemical carbon dioxide reduction, using two first-row transition metal catalysts, $[\text{Co}(\text{CR})\text{Cl}_2]\text{ClO}_4$ (CR = 2,12-dimethyl-3,7,11,17- tetraazabicyclo[11.3.1]-heptadeca-1(17),2,11,13,15-pentaene) and $[\text{Co}(\text{qpy})(\text{OH}_2)_2](\text{ClO}_4)_2$ (qpy = 2,2':6',2":6",2'''-quaterpyridine;) will be discussed.