Nanoporous TiO_2 solar cells sensitized with iron(II) complexes of bromopyrogallol red ligand

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Received 2 November 2000; accepted 16 January 2001

Abstract

Complexation of bromopyrogallol ligand with di(aqua)bis(oxalato)iron(II) moiety, $[Fe(II)(H_2O)_2(C_2O_4)_1]^{2-}$, shows enhanced photovoltaic properties when compared with the photovoltaic cells coated by bromopyrogallol ligand only. Electrochemical and absorption spectroscopic data suggest the nature of the lowest electronic transition of iron(II) complex as a $\pi^*_{(bpr)} \leftarrow d\pi_{(Fe)}$, metal to ligand charge transfer transition. Photovoltaic cells coated with bromopyrogallol ligand complexed with iron(II) shows higher stability for photodegradation and incident photocurrent conversion efficiency with a UV radiation blocking filter.

Keywords: Dye sensitization; Photovoltaic cells; Titanium dioxide; Bromopyrogallol; Iron(II) complexes