Synthesis and characterization of some new ruthenium (II) complexes as photosensitizers in dye-sensitized solar cells

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Abstract:

New ruthenium (II) complexes, [Ru(DHZ)2(bpy)], [Ru(SCN)2(bpy)(DMSO)2], [Ru(SCN)2(dmbpy)(DMSO)2] and H2[RuCl2(salen)], where bpy = 2,2'-bipyridine, DHZ = 1,5-diphenylthiocarbazone, dmbpy = 4,4'-dimethyl-2,2' bipyridine and salen = 2,2'-ethylenebis(nitrilomethylidene)diphenol were synthesized and characterized by elemental analysis, FTIR, UV-Vis spectroscopy and thermal analysis. From data of these investigations the structural formula and the mode of bonding were obtained. These complexes were successfully applied to sensitization of nano-crystalline TiO2 based solar cells (DSSCs). The photovoltaic efficiencies of the studied DSSCs increase in the following order [Ru(DHZ)2(bpy)]

Keywords:

Dye-sensitized solar cells, Ruthenium complexes, PANI, K3[Fe(C2O4)3].

Published In:

Journal of Advances in Chemistry, Volume 12 Number 5, 4413-4426