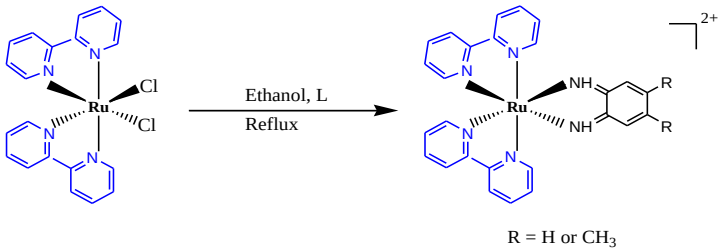
Ruthenium(II)-bipyridine complexes containing diamine ligands as dye-sensitized solar cell (DSC)

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Abstract

Two ruthenium(II) dye sensitizers of general formulae $[Ru(bpy)_2(bqdi)](PF_6)_2$ **Ru-D1** and $[Ru(bpy)_2(dmbqdi)](PF_6)_2$ **Ru-D2** (bqdi, benzoquinonedimine, dmbqdi, 4,5-dimethylbenzoquinonedimine and bpy is 2,2'-bipyridine) have been prepared and their structures were elucidated by elemental analysis, mass spectroscopy, magnetic, molar conductance, electrochemical, and spectroscopic (FT-IR and UV-Vis, and **^{1}H NMR**) and **XRD** techniques. The complexes are diamagnetic with octahedral arrangement around Ru(II) ion. Their application as dye-sensitized solar cell (DSC) was investigated.



R = H or CH_3

Recent Publications (minimum 5)

1. AL-Baradi, A.M., Al-Shehri, W.A., Badawi, A., Almalki, A.S. and Merazga, A., 2019. A study of the nanostructure and efficiency of solid-state dye-sensitized solar cells based on a conducting polymer. Heliyon, 5(4), p.e01472.
2. Almalki, A.S., Alhadhrami, A., Obaid, R.J., Alsharif, M.A., Adam, A.M.A., Grabchev, I. and Refat, M.S., 2018. Preparation of some compounds and study their thermal stability for use in dye sensitized solar cells. Journal of Molecular Liquids, 261, pp.565-582.
3. Almalki, A.S., Alhadhrami, A., Adam, A.M.A., Grabchev, I., Almeataq, M., Al-Humaidi, J.Y., Sharshar, T. and Refat, M.S., 2018. Preparation of elastic polymer slices have the semiconductors properties for use in solar cells as a source of new and renewable energy. Journal of Photochemistry and Photobiology A: Chemistry, 361, pp.76-85.
4. Refat, M.S., Elsabawy, K.M., Alhadhrami, A., Almalki, A.S., El-Sayed, M.Y. and Hassan, R.F., 2018. Development of medical drugs: Synthesis and in vitro bio-evaluations of nanomedicinal zinc–penicillins polymeric hydrogel membranes for wound skin dressing by new chemical technology. Journal of Molecular Liquids, 255, pp.462-470.
5. Almalki, A.S. and Refat, M.S., 2017. Synthesis and Photostability of 2-(4-isobutoxyphenyl)-6-Hydrazino-1, 8-Naphthalimide as Fluorescence Dye and Its Selenium Nanoscale Complex Doped in Polymethyl Methacrylate Polymeric Sheet Exposed to UV-Vis Radiation. Journal of Computational and Theoretical Nanoscience, 14(9), pp.4616-4623.



Biography (150 word limit)

Dr. Abdulraheem Safar Ali Almalki received his master and Ph.D. degrees from the University of Sheffield (October 2011 – September 2015) in the field of polymer sciences more precisely in the field of solar cells. He subsequently returned to university of Taif, Faculty of Science, Department of Chemistry, KSA as an assistance professor. He was responsible for conducting fundamental research into polymeric materials these include conjugated polymers, composites material, nano-scale materials and hybrid polymers for organic electronics and biological applications. A.S.A. Almalki has many publications in peer-reviewed scientific journals. He is an expert in the trend of design, synthesis and exploitation of the unique physical properties of organic conjugated polymers for application in bulk-heterojunction (BHJ) solar cells and organic light-emitting diodes.

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