CHEMISTRY

Application of metal-organic framework materials in dye-sensitized solar cells. RYAN BOGGESS, BANGBO YAN, Department of Chemistry, Western Kentucky University, Bowling Green, KY 42101.

Dye-sensitized solar cells play an important role in the renewable energy research due to their relatively low production cost, more environmental-friendly manufacture, and mechanical robustness. Recently, our lab has synthesized a series of new metal-organic frameworks (([Ru(H2bpc)M(bpc)(Hbpc)2(H2O)], H2bpc=2,2’-bipyridine-4,4’-dicarboxylic acid, M = Cu, Ni, Fe). Their structures contains zigzag chains of [Ru(bpc)3]n- complex ions linked by transition metal complexes, and shows strong visible light absorption. These framework materials are excellent candidates as dyes in dye-sensitized solar cells because of their visible light absorbing group [Ru(bpc)3]n- and carboxylate groups in the structures. Properties of solar cells made of titanium oxide photoanode and metal-organic dyes will be presented.