

ABSTRACT

DISSERTATION/THESIS/RESEARCH PAPER/CREATIVE PROJECT: Synthesis and Doping of Nickel and Zinc Tungstate With Group 11 Elements for the Analysis of Photocatalytic Properties

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This study presents two metal tungstates, nickel (NiWO_4) and zinc (ZnWO_4), modified with silver and copper respectively. It has been found that doping of nickel tungstate with silver was not possible through coprecipitation methods due to a dopant migration effect which deposits silver onto the surface of the catalyst. Surfactant mediated hollow NiWO_4 nanostructures were also synthesized in the presence of silver through a soft template method. Both these modified NiWO_4 structures showed increased photodegradation of methylene blue dye under UV irradiation normalized by mass. The zinc tungstate samples showed homogeneity of copper dispersed throughout the crystal without forming a heterostructure. It was shown that a competition between dopant types causes low doping of ZnWO_4 with copper to be inactivated, while higher amounts increase the activity of the tungstate under UV irradiation.