
View Abstract

ABSTRACT SYMPOSIUM NAME: Nanoscience: Applications of Nanomaterials

ABSTRACT SYMPOSIUM PROGRAM AREA NAME: INOR

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PRESENTATION TYPE: Poster Only : Consider for Sci-Mix

TITLE: Photocatalytic activity of nanocrystalline CeNiO₃ perovskite and its entropy-stabilized derivatives towards Azo dyes degradation

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ABSTRACT BODY:

Abstract: The need for new materials with a wide variety of properties has increased in the past few decades. For this reason, perovskite materials have been widely investigated due to the multiple possibilities of doping these compounds and tailoring their properties. Perovskites have been proven to be excellent candidates for a large number of new technologies. In this research, nanocrystalline oxide perovskites based on transition metals and lanthanides were synthesized. We introduced new elements by doping the parent structure, CeNiO₃, to increase the configurational entropy of the system. This approach was used in order to increase their stability and induce new properties. Perovskites were synthesized by a modified citrate sol-gel method and all compounds underwent one-step calcination at 600 °C in an air atmosphere with a heating rate of 2 °C/min. The obtained compounds were primarily characterized by X-ray powder diffraction (PXRD) and thermogravimetric analysis (TGA). Band gaps were calculated from UV/Vis absorption spectra using the Tauc method. Band gap values were in the range of 5 to 6 eV, which is roughly in the semiconductor area. Specific surface area and pore size distribution were determined by physisorption measurements. The oxygen mobility of compounds was tested by isotope exchange of their oxygen with ¹⁸O₂ and C¹⁸O₂ in temperature-programmed modes. The photocatalytic activity of synthesized compounds towards the degradation of methylene blue (MB), rhodamine B (RDB), and naphthol green B (NG) was monitored by UV/Vis spectroscopy.

(No Image Selected)

Presentation Preference: I wish to participate in an in-person session in Indianapolis.

