EW-P009

Solvothermal Synthesis and Photocatalytic Property of SnNb2O6

서세원[1], 이찬우[1], 성원모[1], 허세윤[1], 김상현[1], 이명환[1], 홍국선[1,2]

[1]WCU Hybrid Materials Program, Department of Materials Science and Engineering, Seoul National University, [2]Research Institute of Advanced Materials (RIAM), Seoul National University, Seoul 151-744, Korea

SnNb2O6 nanoplates were prepared by a solvothermal synthesis with water and ethanol mixed solvent. For improvement of their properties, as-prepared SnNb2O6 nanoplates also were calcined. The prepared powder was characterized by X-ray diffraction (XRD), field emission scanning electron microscope (FESEM), Transmission electron microscope (TEM), UV-vis spectroscopy, Raman spectrometer, Brunauer-Emmett-Teller (BET). The calcined nanoplates have a smaller surface area than the as-prepared nanoplates have. Nevertheless, in the case of the optical absorption properties, the calcined nanoplates could absorb more photon energy, due to their smaller band gaps. The Raman analysis revealed that the Nb-O bond length in the calcined nanoplates was longer than that in the as-prepared nanoplate. The higher optical absorption capability of the calcined nanoplates was attributed to the local structure variation within them. Furthermore the high crystallinity of the calcined nanoplates is effective in improving the generation of charge carriers. So, It was found that the calcined nanoplates exhibited superior photocatalytic activity for the evolution of H2 from an aqueous methanol solution than the as-prepared nanoplates under UV and visible irradiation. Therefore, the enhanced photocatalytic activity of the calcined nanoplate powder for H2 evolution was mainly attributed to its high crystallinity and improved optical absorption property resulting from the variation of the crystal structure.

Keywords: SnNb2O6, Photocatalytic activity, H2 evolution, Visible, Solvothermal

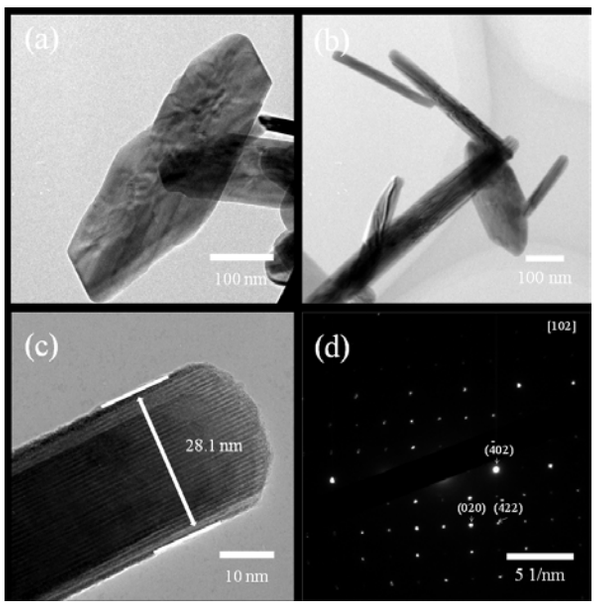

Fig. 1

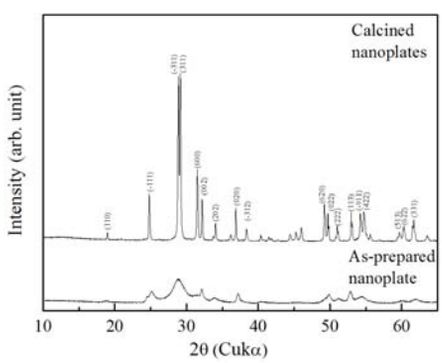

Fig. 2

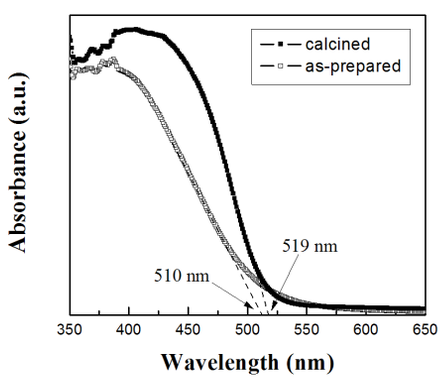

Fig. 3

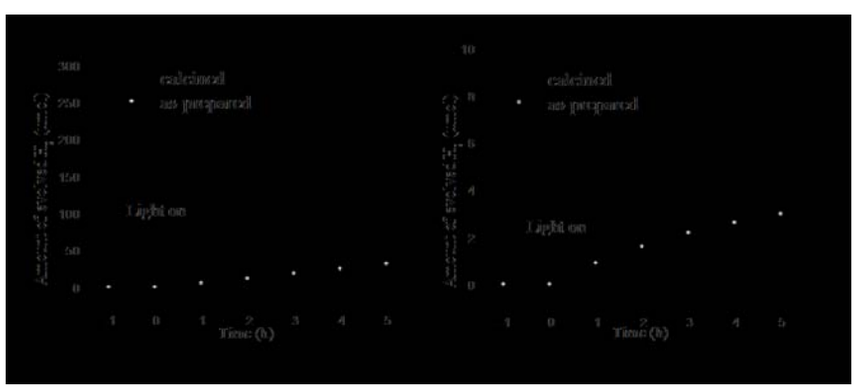

Fig. 4