

Preparation of $\text{Na}_{1-x}\text{La}_x\text{Ta}_{1-x}\text{Co}_x\text{O}_3$ by Spray Pyrolysis for Photocatalytic Water Splitting under Visible Light

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Photocatalytic water splitting by photocatalysts is one of the promising schemes to produce hydrogen from water. Among the various metal oxide semiconductor photocatalysts, NaTaO_3 was reported to one of the most efficient photocatalysts for water splitting UV light. But, visible light driven photocatalysts are strongly needed to utilize solar energy efficiently. In the present study, metal ion co-doping such as La and Co was conducted to drive visible light photocatalytic water splitting by NaTaO_3 . Submicron and spherical $\text{Na}_{1-x}\text{La}_x\text{Ta}_{1-x}\text{Co}_x\text{O}_3$ particles were prepared by spray pyrolysis at lower temperature and shorter reaction time than solid state reaction. Characteristics of $\text{Na}_{1-x}\text{La}_x\text{Ta}_{1-x}\text{Co}_x\text{O}_3$ particles were analyzed by SEM, XRD and DRS. Hydrogen production rate from water under visible light ($\lambda > 415 \text{ nm}$) was measured in a reaction system which was composed of 300 W Xe lamp, GC and batch type reactor.