

Catalysis and Electronic Structure Characterization of Ni doped Pyrochlore Structure $\text{La}_2\text{Ce}_2\text{O}_7$

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Abstract

A novel series of pyrochlore structure of $\text{La}_2\text{Ce}_2\text{O}_7$ was doped of Ni in the B-site and their catalytic performance was studied. All the materials $\text{La}_2\text{Ce}_{2-x}\text{Ni}_x\text{O}_{7-0.5x}$ ($x=0.1-0.45$) were characterized by X-ray powder diffraction (PXRD), X-ray photoelectron spectroscopy (XPS), X-ray absorption spectroscopy (XAS) and temperature-programmed reduction (TPR). From the oxidative steam reforming reaction, the catalytic performance was affected by the Ni content and the selectivity of syngas (H_2+CO) of the $x=0.45$ reached to the highest value of 150 % which was stable in the ethanol conversion 100%. And the performance of the optimized catalyst was monitored for 50 hrs.

Keywords: Green chemistry; Oxidative steam reforming reaction; Catalyst

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