

## The Effect of Ni/Dolomite Catalyst for Production of Hydrogen from NaBH<sub>4</sub>

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**Abstract :** Hydrogen will be arguably the best fuel in the future as it is the most abundant element in the universe. Hydrogen, as a fuel, is notably environmentally benign, sustainable and has high energy content compared to other sources of energy. It can be generated from both conventional and renewable sources. The hydrolysis reaction of metal hydrides provides an option for hydrogen production in the presence of a catalyst. In this study, Ni/dolomite catalyst was synthesized by the wet impregnation method for hydrogen production by hydrolysis reaction of sodium borohydride (NaBH<sub>4</sub>). Besides, the synthesized catalysts characterizations were examined by means of thermogravimetric analysis (TGA), Fourier-transform infrared spectroscopy (FT-IR), X-ray diffraction (XRD), Brunauer -Emmett - Teller (BET) and scanning electron microscopy (SEM). The influence of reaction temperature (25-75 °C), reaction time (15-60 min.), amount of catalyst (50-250 mg) and active metal loading ratio (20,30,40 wt.%) were investigated. The catalyst prepared with 30 wt.% Ni was noted as the most suitable catalyst, achieving of 35.18% H<sub>2</sub> and hydrogen production rate of 19.23 mL/gcat.min at 25 °C at reaction conditions of 5 mL of 0.25 M NaOH and 100 mg NaBH<sub>4</sub>, 100 mg Ni/dolomite.

**Keywords :** sodium borohydride, hydrolysis, catalyst, Ni/dolomite, hydrogen

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