



## Pt-Ni/Al<sub>2</sub>O<sub>3</sub> Bimetallic Catalysts for Vapor Phase Dehydrogenation of Decalin

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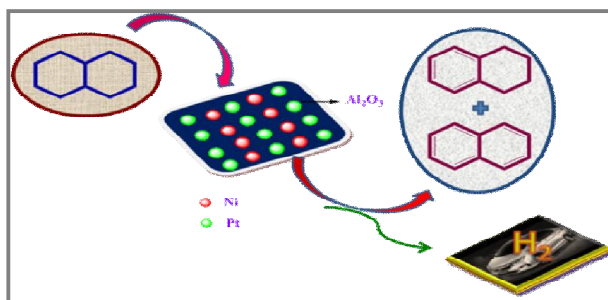
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### ABSTRACT

The present study investigates the promotional effect of bimetallic catalysts compared to the monometallic catalysts in vapor phase dehydrogenation of decalin. A series of Al<sub>2</sub>O<sub>3</sub> supported Pt-Ni bimetallic and their monometallic catalysts were prepared by sequential wet impregnation and simple wet impregnation methods respectively. As synthesized catalysts were characterized by powder XRD, BET-surface area, Temperature programmed reduction (H<sub>2</sub>-TPR), H<sub>2</sub>-pulse chemisorption, TGA, CHNS analysis, SEM and TEM techniques. 1wt.% Pt-3 wt. % Ni/Al<sub>2</sub>O<sub>3</sub> catalyst exhibited the highest dehydrogenation activity than corresponding monometallic catalysts due to the presence of more number of active metallic sites in the catalyst. The hydrogen evaluation rate over 1 wt.% Pt-3 wt. %Ni/ Al<sub>2</sub>O<sub>3</sub> catalyst was about  $30.32 \times 10^{-6} \text{ sec}^{-1}$  during 10 h time on stream study.

### Graphical Abstract



**Keywords:** Decalin, Pt-Ni, Bimetallic catalysts, Dehydrogenation.