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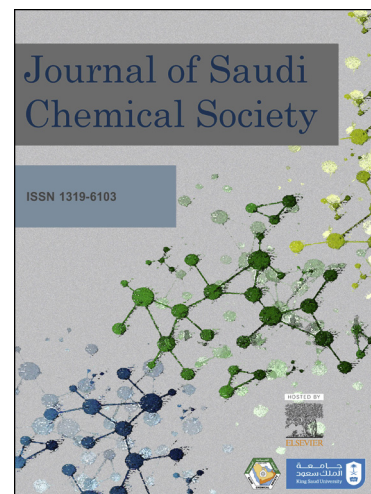
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Ytterbia Doped Nickel-Manganese Mixed Oxide Catalysts for Liquid Phase Oxidation of Benzyl Alcohol

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Abstract:

Nickel-manganese mixed oxides doped with 1, 3, 5 mol % ytterbia have been prepared by co-precipitation method and used in the catalytic oxidation of benzyl alcohol. Catalytic activity of these oxides calcined at 400 °C and 500 °C was studied for selective oxidation of benzyl alcohol to the corresponding aldehyde using molecular oxygen as an oxidizing agent. The results showed that thermally stable 5 mol % ytterbia doped nickel-manganese oxide [Yb₂O₃-(5%)- Ni₆MnO₈] exhibited highest catalytic performance when it was calcined at 400 °C. A 100% conversion of the benzyl alcohol was achieved with >99 % selectivity to benzaldehyde within a reaction period of 5 hrs at 100 °C. The mixed oxide prepared has been characterized by scanning electron microscopy (SEM) and energy dispersive X-ray analysis (EDXA), X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FT-IR), thermogravimetric analysis (TGA), Brunauer Emmett Teller (BET) and Temperature programmed reduction (H₂-TPR).

Keywords: Ytterbia, nickel-manganese mixed oxides, catalytic activity, oxidation, benzyl alcohol.

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