

SOLID STATE SYNTHESIS AND CHARACTERISATION OF VANADIUM ANTIMONY MIXED OXIDE CATALYSTS

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ABSTRACT

Vanadium antimony mixed oxide catalysts were prepared by the solid state method, and then subjected to heat treatment. Samples were analysed using XRD, FTIR, BET specific surface area (S_{BET}), scanning electron microscopy (SEM), temperature programmed desorption (TPD) and temperature programmed reduction (TPR). XRD showed a very intense and sharp peaks indicating of the high crystallinity of the particles, whereas SEM showed irregular shapes morphology which became aggregated with increase in the heating temperature. This in turn affects the S_{BET} value which became decreased as the calcination temperature was increased. FTIR spectrum of the calcined samples showed bands typical of the crystalline Sb_2O_4 and VSbO_4 were developed upon increasing calcinations temperature. In the oxygen TPD of VSbO samples, only one desorption energies of 258 kJmol^{-1} was observed. While three peak maxima were observed in the rate of anaerobic reduction of H_2 indicating that three types of kinetically different oxygen states exist in the catalyst.

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