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A Study on Kinetic of Nitrous Oxide Catalytic Decomposition over CuO/HZSM-5

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Abstract : The catalyst of copper oxide loaded on HZSM-5 was developed for nitrous oxide (N_2O) direct decomposition. The kinetic of nitrous oxide decomposition was studied for CuO/HZSM-5 catalyst prepared by incipient wetness impregnation method. The external and internal diffusion of catalytic reaction were considered in the investigation. Experiment results indicated that the external diffusion was basically eliminated when the reaction gas mixture gas hourly space velocity (GHSV) was higher than $9000h^{-1}$ and the influence of the internal diffusion was negligible when the particle size of the catalyst CuO/HZSM-5 was small than 40-60 mesh. The experiment results showed that the kinetic of catalytic decomposition of N_2O was a first-order reaction and the activation energy and the pre-factor of the kinetic equation were 115.15kJ/mol and of 1.6×109, respectively.

Keywords : catalytic decomposition, CuO/HZSM-5, kinetic, nitrous oxide
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