

Direct decomposition of N₂O over Mg-Fe mixed oxides prepared from hydrotalcite-like Compounds

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Nitrous oxide which contributes to catalytic stratospheric ozone destruction is a strong greenhouse effects gas. Catalytic decomposition of N₂O and selective catalytic reduction of N₂O with reductants such as hydrocarbons have been proposed as the method of N₂O abatement. The catalytic decomposition of N₂O was studied over Mg-Fe hydrotalcite-like catalysts (Mg/Fe molar ratios of 1:1, 2:1, 3:1, 1:2) prepared by hydrothermal and co-precipitation methods (varying Mg/Fe molar ratios). For comparison, Co, Cu, Fe, Ni, Ce hydrotalcite-like compounds were prepared by hydrothermal synthesis hydrotalcite-like compounds and Mg-Fe oxide catalysts were characterized using various. The reactions were carried out under atmospheric pressure in the temperature range 300-600°C and the reactant mixture was typically composed of 5000 ppm N₂O in balance He. The effect of N₂O and O₂ concentration on the catalytic behavior has been investigated. According to pretreatment temperature, the decomposition experiments of nitrous oxide were also performed. The correlation between catalytic activity and oxidation state of transition metals Fe was discussed.