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## **Alkali Metals as Promoters in Co-Mn-Al Mixed Oxide for N<sub>2</sub>O Decomposition**

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Catalytic decomposition of N<sub>2</sub>O belongs to the Best Available Technologies for N<sub>2</sub>O abatement from HNO<sub>3</sub> production. The aim of presented contribution is evaluation of alkali metals promoters effect in Co-Mn-Al mixed oxide (molar ratio Co:Mn:Al = 4:1:1) on the low temperature N<sub>2</sub>O catalytic decomposition.

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Alkali promoted Co<sub>4</sub>MnAlO<sub>x</sub> mixed oxide (molar ratio of alkali metal/Co = 0.037) were prepared by impregnation of calcined Co-Mn-Al hydrotalcite (molar ratio Co:Mn:Al = 4:1:1) with an aqueous solution of Li, Na, K, Rb or Cs nitrate. The catalysts were characterized by XPS, TPR-H<sub>2</sub>, TPD CO<sub>2</sub> and NH<sub>3</sub>, SEM and tested for N<sub>2</sub>O decomposition in inert gas and simulated waste gas from HNO<sub>3</sub> production.

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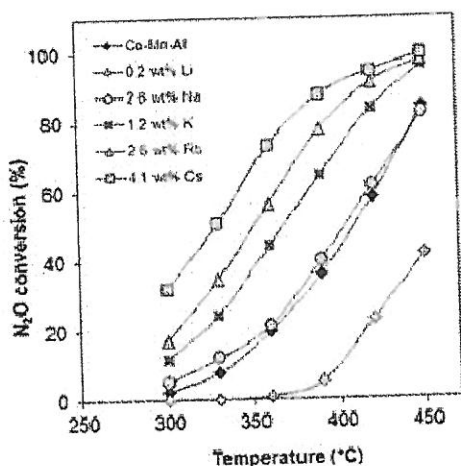


Fig. 1 Temperature dependence of N<sub>2</sub>O conversion. Conditions: 0.1 mol% N<sub>2</sub>O in He, WHSV = 60 l h<sup>-1</sup> g<sup>-1</sup>

N<sub>2</sub>O conversion over alkali promoted Co<sub>4</sub>MnAlO<sub>x</sub> mixed oxide decreased in order Cs > Rb > K > Na = Co<sub>4</sub>MnAlO<sub>x</sub> > Li in inert gas (Fig. 1) and was shifted to the lower values in the presence of typical components (NO<sub>x</sub>, O<sub>2</sub> and H<sub>2</sub>O) of flue gas. The addition of alkali promoters to the Co<sub>4</sub>MnAlO<sub>x</sub> mixed oxide resulted in a modification of both electronic properties of active metals and acid-base function of the catalyst surface. The promotional effect of alkali metals is connected with their ionization potential, the charge transfer to the catalyst and a decrease in binding energies of all catalyst components (Co, Mn, Al and O).

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