

SUCCESSFUL USE OF ELECTROPOSITIVE PROMOTERS IN De-NO_x Pt-GROUP METALS CATALYTIC CHEMISTRY

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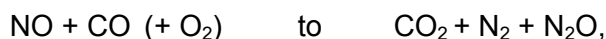
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EXTENDED ABSTRACT

Recent studies of our research group have shown that the catalytic activity and selectivity of supported Pt-group metal catalysts can be remarkably increased by using electropositive promoters, such as alkali or alkaline earth metals.

Rate increases for reactions of high environmental significance, such as



in the presence or absence of oxygen, by two orders of magnitude are typically achievable, while at the same time the selectivity towards N₂ is improved typically by 30-60 percentage units, thus approaching the absolute value of 100%, for conditions under which automotive three-way catalytic converters operate.

In this paper we present in a comparative manner all our recent experimental work upon these catalyst/reaction systems and we propose a general model which explains satisfactorily the mode of action of electropositive promoters on NO_x surface catalytic chemistry.

The results demonstrate that the insight obtained from these studies can be successfully used to the development of novel three-way catalyst formulations for the effective control of car emissions. These new catalytic materials are also significantly more economic compared with the currently used materials in three-way catalytic converters (TWCs).

Key words: TWCs, Platinum, Palladium, Propene, Promotion, Alkalis, Alkaline earths, Platinum group metals, De-NO_x chemistry, NO reduction.