Catalytic Effect of metal promoters on Co/Al_2O_3 in the CO_2 dry reforming with methane

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Carbon dioxide reforming of methane has been studied over Co/Al_2O_3 catalyst promoted with different metal additives(Ru, Ir, La, Ce, Zr) for improving catalysts performance and preventing coking.

BET, XRD, ICP Mass, EDS and TEM were applied for sample characterization and dry reforming of methane was carried out a feed mixture consisted of $CH_4/CO_2/N_2$=40/40/20 ratio. The amount of deposited carbon on used catalysts was determined after ca. 20hr of time on stream reaction at 973K with 20,000ml/g_{cat}·hr.

Different activity levels of the catalysts clearly show that the type of the promoter significantly affected the metal dispersion properties and catalytic performances of Co/Al_2O_3 catalysts. Co/Al_2O_3 catalyst of modified Ru-Zr exhibited the highest activity and stability among all the catalysts prepared.