Low-cost catalysts for the control of indoor CO and PM emissions from solid fuel combustion

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Description
Cu–Mn based mixed oxide type low-cost catalysts have been prepared in supported form using mesoporous Al_2O_3, TiO_2 and ZrO_2 supports. These supports have been prepared by templating method using a natural biopolymer, chitosan. The synthesized catalysts have been characterized by XRD, BET-SA, SEM, O_2–TPD and TG investigations. The catalytic activity for CO as well as PM oxidation was studied, in a view of their possible applications in the control of emissions from solid fuel combustion of rural cook-stoves. The trend observed for the catalytic activity of the synthesized catalysts for CO oxidation was $ZrO_2 > TiO_2 > Al_2O_3$ while for PM oxidation it was observed to be $TiO_2 > ZrO_2 > Al_2O_3$. The effect of CO_2, SO_2 and H_2O on CO oxidation activity was also investigated, and despite partial deactivation, the catalysts show good CO oxidation activity. An effective regeneration treatment was attempted by …