

Catalytic pyrolysis of difluorochloromethane to produce tetrafluoroethylene

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The catalytic pyrolysis of difluorochloromethane (CHClF_2 , R22) over aluminum fluoride, calcium fluoride and their physical mixture was investigated and the effect of Cu addition on the conversion and selectivity was also studied. The catalytic pyrolysis of R22 over prepared catalyst was compared with a non-catalytic pyrolysis. All catalysts deactivated with time-on-stream. Alteration of conversion and selectivity as a function of reaction time was observed. In the catalytic pyrolysis of R22, the selectivity for trifluoromethane (CHF_3 , R23) decreased with time-on-stream, whereas the selectivity for tetrafluoroethylene (C_2F_4 , TFE) increased. The conversion of R22 in the catalytic pyrolysis was significantly higher than that in the non-catalytic. The Cu-promoted catalysts were more selective toward TFE than unpromoted catalysts. The enhanced TFE yield by adding the metallic Cu catalysts can be explained by the increased heat transfer effect. In this study, the physical mixture catalysts of aluminum fluoride and calcium fluoride showed the highest selectivity and yield for TFE.