

OBTAINEMENT OF PENTAFLUOROETHANE FROM DICHLOROTETRAFLUORO-
ETHANE - Note I

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Gaseous fluorination with hydrogen fluoride at atmospheric pressure of the two isomers $\text{CClF}_2\text{-CClF}_2$ and $\text{CF}_3\text{-CCl}_2\text{F}$ was continuously carried out on a chromic oxide based catalyst. The fluorinated derivative, obtained at a selectivity higher than 90%, was pentafluorochloroethane. Hexafluoroethane and an isomeric mixture of trichlorotrifluoroethanes were obtained as byproducts. The latter were recycled to fluorination together with unconverted $\text{C}_2\text{Cl}_2\text{F}_4$. Both conversion of $\text{C}_2\text{Cl}_2\text{F}_4$ and selectivity to C_2ClF_5 were affected by temperature, contact time and molar ratio of the reagents.

The catalytic activity of chromic oxide was adversely affected by small amounts of water in the hydrogen fluoride. A difference in reactivity between the two isomers $\text{CF}_3\text{-CCl}_2\text{F}$ and $\text{CClF}_2\text{-CClF}_2$ was also observed.

It was also observed that the byproduction of $\text{C}_2\text{Cl}_3\text{F}_3$ was due to the disproportionating activity of chromic oxide versus $\text{C}_2\text{Cl}_2\text{F}_4$.