

SOME REACTIONS OF TETRAFLUOROETHYLENE OLIGOMERS

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As part of a programme to prepare and evaluate a series of perfluorochemicals for use as inert fluids, the fluorinations of some tetrafluoroethylene oligomers over cobalt (III) fluoride have been studied.

Fluorination of perfluoro-3,4-dimethylhex-3-ene (tetramer) and perfluoro-4-ethyl-3,4-dimethylhex-2-ene (pentamer) over CoF_3 at 230°C and 145°C respectively afforded the corresponding saturated fluorocarbons however, at 250°C, pentamer gave predominantly the saturated tetramer. The thermal behaviour of these saturated fluorocarbons alone and in the presence of bromine and toluene has been studied.

Pyrolysis of pentamer over glass beads at 500°C gave perfluoro-1,2,3-trimethylcyclobutene and isomers of perfluoro-2,3-dimethylpenta-1,3-diene. Under similar conditions perfluoro-2-(1-ethyl-1-methylpropyl)-3-methylpenta-1-ene (hexamer) gave perfluoro-1-methyl-2-(1-methylpropyl)-cyclobut-1-ene and perfluoro-2-methyl-3-(1-methylpropyl)-buta-1,3-diene.

These reactions and the structural elucidation of the products will be discussed.