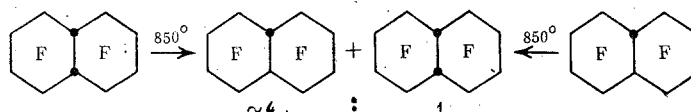


V. E. Platonov, K. V. Dvornikova,
I. P. Prokudin, B. A. Mel'nichenko,
and G. G. Yakobson

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Pure cis- and trans-perfluorodecalins have been described by Smith and Homer [1]. However, the isomerization and stability of these isomers has not been studied.

We have studied the behavior of cis- and trans-perfluorodecalins at high temperature and shown that they may undergo isomerization. A mixture with virtually the same 1:4 ratio of cis- and trans-perfluorodecalins is obtained passing the pure isomers through a flow system at 840-850°C (~15% cis-isomer and ~60% trans-isomer). The extent of isomerization is diminished upon lowering the temperature to 700-800°C. In this case, the trans-isomer, in contrast to the cis-isomer, remains virtually unchanged. At 785°C, the cis-isomer gives a mixture of 38% cis-isomer and 62% trans-isomer, while the trans-isomer forms a mixture consisting of 93% trans-isomer and 7% cis-isomer.



These results indicate greater stability for trans-perfluorodecalin relative to its cis-isomer, which is in accord with the relative stabilities of their nonfluorinated analogs [2].

Perfluorodecalin (3 g) was passed over 10 min in a 3 liter/h argon stream through a 400 × 20-mm quartz tube at 700-850°C. The yield of the reaction mixture was 85-65% at 700-800°C and 60-40% at 840-850°C. The ratio of the isomers in the reaction mixture was determined using ^{19}F NMR spectroscopy and gas-liquid chromatography.

LITERATURE CITED

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