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# PERFLUOROHEPTENE-1; NUCLEOPHILIC REACTIONS AND MECHANISM

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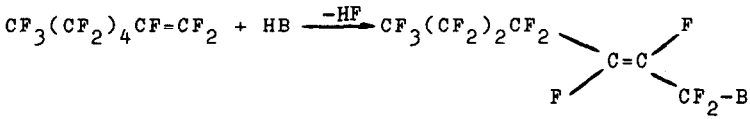
n-Perfluoroheptene-1 is a reactive terminal F-olefin, sensitive to nucleophiles. The reactions with oxygen-[1], sulfur-[2], nitrogen- and carbon-nucleophiles have been investigated and the formed structures are determined. According to the general formula



B: $-OCH_3$, $-OC_6H_5$, $-OC_6H_4SO_3Na$, $-SO_3Na$, $-HN(CH_2)_3N(CH_3)_2$

allylic substitution can be observed besides addition. Only in the case of the carbon nucleophiles butyllithium and sodium malonate vinylic substitution takes place contrary to the reactions mentioned above. The reaction kinetics of F-heptene with phenolate is of 2. order with a rate constant of $5{,}2.10^{-2}$ l/mol s. In connection with trapping experiments a two step addition-elimination process via a carbanion intermediate is proposed as mechanism. From the viewpoint of stereochemistry trans addition gives mainly the favoured e-isomer. Structural identification was done by full $^{19}$F-NMR analysis with vibrational spectroscopic investigations in addition. Hydrolysis of F-heptene-1 in strong alkaline aqueous solution yields in the first step H-F-heptancarboxylic acid, which undergoes subsequent dehydrofluorination, decarboxylation etc. Some of the reaction products mentioned represent a new type of very active fluorosurfactants [3].

1 U. Groß, W. Storek, J. Fluorine Chem. 26, 457 (1984)

2 U. Groß, G. Engler, J. Fluorine Chem. (1985) in press

3 U. Groß, G. Engler, D. Prescher, lecture, held on the VI. Int. Conf. of Surface Active Substances, Bad Stuer, April 1985