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CHLORINE SUBSTITUENT AND THE REGIOSELECTIVITY OF ADDITIONS TO FLUOROOLEFINS

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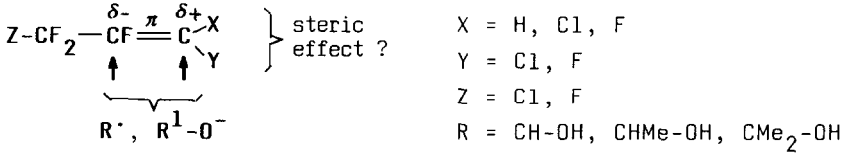
A chlorine atom bonded to a fluoroolefin double-bond can dramatically influence the regioselectivity of both radical and ionic additions, as has been both formerly [1,2] and recently [3] documented in the literature.

This contribution summarizes the results of a study of additions of nucleophilic species to chlorofluoropropenes. The aim of the study was to verify how efficient is the steric effect of a chlorine atom at the terminal position of the double bond in chlorofluoropropenes of the general formula



It has been found that the course of the additions of nucleophilic radicals in solution is mainly influenced in two respects:
1) the attack ratio at position 2 is enhanced and thus the regioselectivity becomes lower; 2) the olefin reactivity is dramatically diminished.
The observations are compared with the electronic structure of the olefins.

Similar results were obtained [3,4] in additions of alkoxides to halogenopropenes R_F-CF=CCl_2.

1 J.M. Tedder, Angew. Chem., 42 (1982) 433.
2 O. Paleta, Usp. Khim., 40 (1971) 883.
3 Ch.-M. Hu and Z.-Q. Xu, J. Fluorine Chem., 42 (1989) 69.
4 J. Kvíčala, unpublished results.