

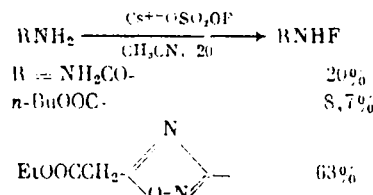
N-FLUORINATION OF SEVERAL NITROGEN COMPOUNDS BY CESIUM FLUOROXYSULFATE

A. A. Gakh, S. V. Romaniko,
A. A. Fainzil'berg, and K. G. Nikishin

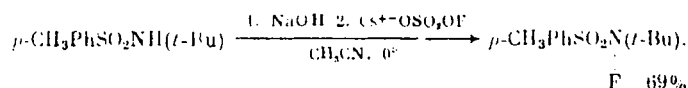
UDC 542.944:546.36'226+546.16:
547.495.2:547.82

Cesium fluoroxysulfate (CFS) is a unique anionic electrophile, which may be used as a mild fluorinating agent in the synthesis of organofluorine compounds [1]. On the other hand, the feasibility of forming N-F bonds using CSF has not yet been noted.

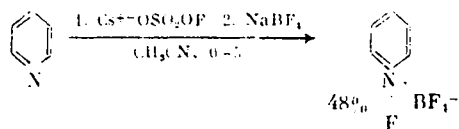
We are the first to have established that the reaction of CSF with several compounds containing an amino group gives N-fluoro derivatives.



Monofluoro derivatives are predominantly formed. Difluoro derivatives are obtained only in the case of urea. Under analogous conditions, less reactive sulfamides give only traces of N-fluoro derivatives although their sodium salts are fluorinated by CSF in good yield.



Highly basic aliphatic amino derivatives such as pyridine and morpholine and electron-donor heterocyclic systems, such as dimethylpyrazoles and methylimidazoles, do not give N-fluoro derivatives with CSF. On the other hand, pyridine is smoothly fluorinated at the nitrogen group by the action of CSF.



The somewhat different results obtained by Stauber and Zupan [2] in a study of this reaction are apparently a consequence of secondary processes characteristic for N-fluoropyridinium salts [3].

Comparative analysis of these results indicates that CSF is a much less active fluorinating agent than elementary fluorine and even hypofluorites, R₂-OF, but is significantly more active than FClO₃ [4].

LITERATURE CITED

1. S. T. Purington, B. S. Kagen, and T. B. Patrick, Chem. Rev., **86**, 997 (1986); M. Zupan, Vestn. Slov. Kem. Drus., **31** (suppl), 151 (1984).
2. S. Stauber and M. Zupan, J. Fluor. Chem., **45**, 140 (1989).
3. T. Umemoto and G. Tomizawa, J. Org. Chem., **54**, 1726 (1989); T. Umemoto and G. Tomizawa, Tetrahedron Lett., **28**, 2705 (1987); D. Rozen and D. Hebel, Heterocycles, **28**, 249 (1989).
4. A. V. Fokin, Yu. N. Studnev, and L. D. Kuznetsova, Reactions and Research Methods of Organic Compounds [in Russian], Book 24, Khimiya, Moscow (1976).

N. D. Zelinskii Institute of Organic Chemistry, Academy of Sciences of the USSR, Moscow. Translated from Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No. 8, pp. 1936-1937, August, 1991. Original article submitted March 18, 1991.