NUCLEOPHILIC ISOMERISATION OF HEXAFLUORO

A.F.Gontar

A.N.Nesmeyanov Institute of Organoelements Compounds RAS. 119991, Vavilova str.28, M
e-mail: ***gontar@ineos.ac.ru***

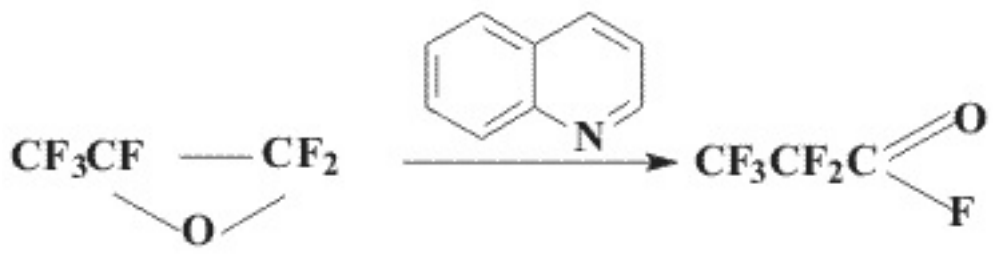
Attempts to obtain pentafluoropropionyl fluoride (PPF) undertaken earlier [1-8] , except f compound by the action of Yarovenko reagent on pentafluoropropionic acid [9], have no prepara

With the goal to develop a convenient method to obtain PPF in the present work we studi hexafluoropropene oxide (HFPO). The latter is an available product of fluoroorganic manufactur

We studied the action of various reagents (KF, CsF, pyridine, triethylamine and other bases by passing through a heated pipe filled with fluorides of alkali metals and by bubbling HFPO th triethylamine, quinoline) followed by capturing the forming products.

As the result of these experiments it has been found that variations of HFPO flow rate, tem other process parameters do not allow to attain full conversion of HFPO into PPF and as th substances are very close (~-28 o C) it is impossible to isolate PPF in pure form.

At the same time it was found that full HFPO isomerization takes place in a close system und



The found method is extremely convenient and allows producing PPF in great quantities.

Experimental

Quinoline (200g, 1.55 mol) and hexafluoropropylene oxide (2400g, 14.46 mol) are placed capacity) with a needle valve cooled to a temperature of -70 ^{o}C. The autoclave is herme temperature of 10^{o}C there is observed a temperature jump up to 60^{o}C in the autoclave.

The autoclave is placed in a rocking furnace, the temperature is raised to 100 ^{o}C and kept f cooled to room temperature, the product is collected through the needle valve in a trap cooled 2200g of Hexafluoropropionyl fluoride of 97% purity in 92% yield, BP=-28^{o}C.
^{19}F NMR: 8.0 ppm (CF_3), 46 ppm (CF_2), -98 ppm (COF)

References

1.Cox D.G., Sprague L.C., Burton D.G., J. Fluor Chem. 23, 1983, 383-388

2. Pallerite M.J., J. Fluor Chem. 49, 1, 1990, 43-66

3. Ruff M., J. Org. Chem, 30, 1965, 3968

4. Губанов Б.А., Тюльса Г.М., Солодкая И.Г., Шерман М.А., ЖОрХ, 1984,т. 20, N 3,с. 493-498

5. Беренблит В.В., Бызов Б.А., Долгопольский И.М., Долнаков Ю.П., ЖПХ, 1974, т. 47, N 11, с. 2433-2435

6. Беренблит В.В., Бызов Б.А., Долгопольский И.М., Долнаков Ю.П., Грачев В.И., ЖПХ, 1975, т. 48,N3, с. 709-711

7. Sianes D., SasetteA., Tarli F., J. Org. Chem, 31, 1966, 2312

8. Knunyants I.L., Shokina V.V., Galakhov I.V., Khim. Geteroc. S. 1969, 873

9. Фокин А.В., Студнев Ю.Н, Рапкин А.И., Суптанбеков Д.А., Потарина Т.М.,Известия АН СССР, 1984, N 2, 411-415