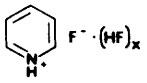
Hydrogen Fluoride-Pyridine Reagent

A Convenient Form of Anhydrous HF

Professor George Olah has pioneered the development of the **hydrogen fluoride-pyridine** reagent (**1**) as a convenient

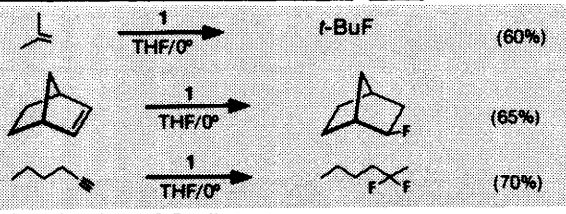


1

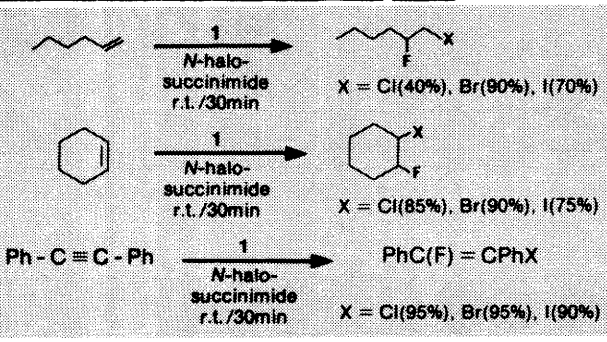
form of anhydrous HF.[1-6] This remarkable reagent consists of pyridinium polyhydrogen fluoride in equilibrium with a small amount of free HF. It is a relatively stable liquid which suffers no appreciable loss of volatile hydrogen fluoride at temperatures up to 50°C.

Below are some of the synthetic transformations that have been achieved by the use of the **hydrogen fluoride-pyridine** reagent.

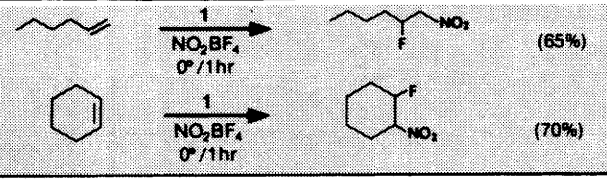
Hydrofluorination of Olefins and Acetylenes[1]



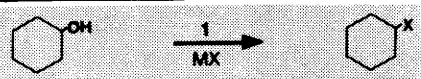
Halofluorination of Olefins and Acetylenes[2]



Nitrofluorination of Olefins[3]

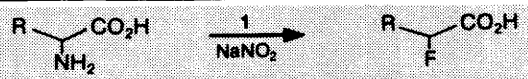


Alkyl Halides from Alcohols[4]



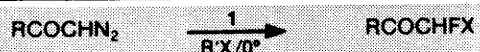
MX = NaF, NaCl, NH_4Br, KI
X = F(51%), Cl(97%), Br(71%), I(80%)

α-Fluoro Acids from α-Amino Acids[5]



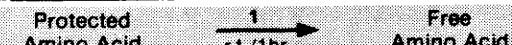
R = Me(96%), Et(80%), *i*-Pr(84%), *i*-Bu(88%), $PhCH_2$(98%), $HOCH_2$(80%), etc.

Halofluorinated Ketones from Diazoketones[6]



R = Et, *c*-Hex, Ph, EtO
R'X = *N*-halosuccinimide or alkali halide
X = H, Cl, Br, I

Deprotection of Amino Acids[7]



Substrate	Yield (%)
Box-Glu(OBzl)-OH	100
Boc-Ser(Bzl)-OH	93
Boc-Thr(Bzl)-OH	95
Boc-His(Tos)-OH	95
Boc-Met-OH	92
H-Phe-OBzl	94
H-Lys(Boc)-O-*t*-Bu	97
Boc-Leu-resin	96
Boc-Pro-resin	92

References:
1) G.A. Olah, M. Nojima, and I. Kerekes, *Synthesis* 779 (1973).
2) G.A. Olah, M. Nojima, and I. Kerekes, *ibid.*, 780 (1973).
3) G.A. Olah and M. Nojima, *ibid.*, 785 (1973).
4) G.A. Olah and J. Welch, *ibid.*, 653 (1974).
5) G.A. Olah and J. Welch, *ibid.*, 652 (1974).
6) G.A. Olah and J. Welch, *ibid.*, 896 (1974).
7) S. Matsuura, C.-H. Niu, and J.S. Cohen, *Chem. Commun.*, 451 (1976).

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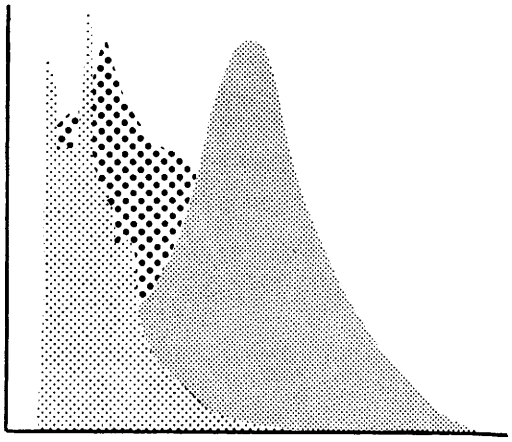

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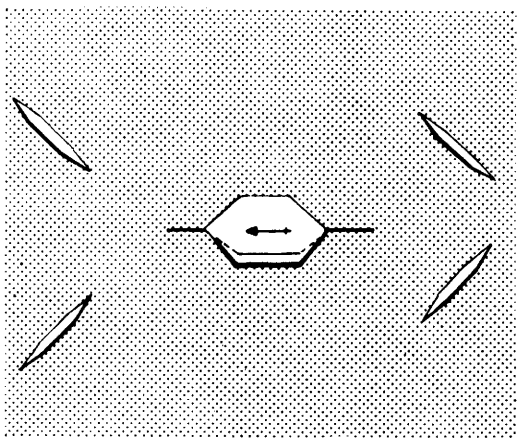

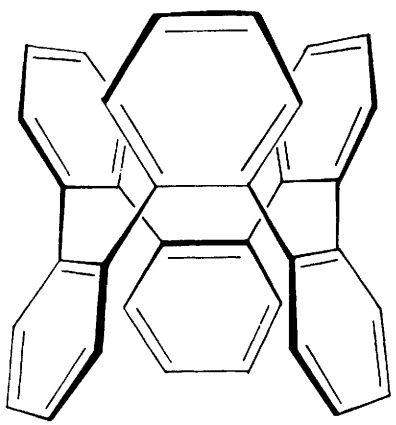

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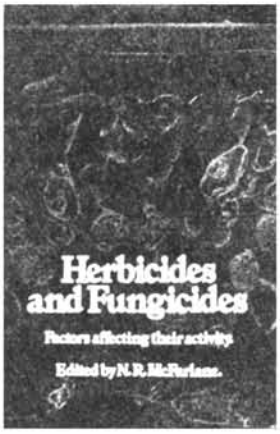

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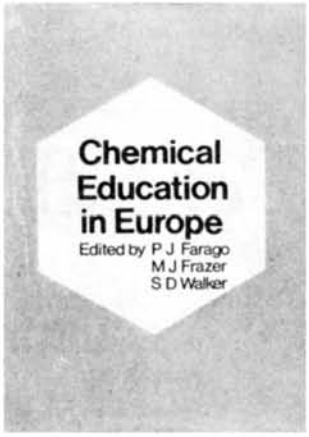

The science of chemistry has always been international and recent developments have added a new reality to this concept. Chemical education in Europe and the United Kingdom can now be regarded as a coherent whole, despite local differences and the exchange of people, both at staff and student levels, is proceeding apace. This book fulfils two needs: it describes the flavour of chemical education in a number of major European countries, based upon the experiences of well-known educators, at both secondary and tertiary levels. In addition it also provides a reference volume, collecting together a mass of information hitherto only available in widely scattered publications, which has been updated through personal interviews and questionnaires. It provides invaluable background and reference material both for those involved in the study and comparison of European education systems, and for those who are thinking of spending some time at an institution in a foreign country.

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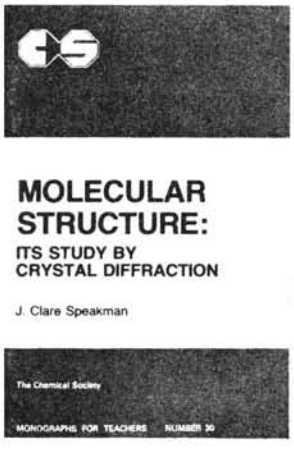

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By J. CLARE SPEAKMAN

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