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OBSERVABLE FLUOROCARBANIONS

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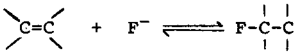
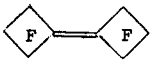
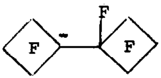
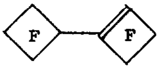
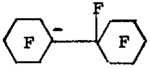
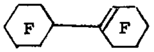
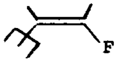
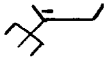
Polyfluorinated alkenes react readily with sources of fluoride ion to produce polyfluoroalkyl anions but these are rarely long lived since they promote oligomerisation reactions of the precursor alkene. However, when a sufficiently reactive alkene (1) is contacted with an active source of fluoride ion in a suitable solvent, homogeneous coloured solutions of the corresponding carbanion (2) are produced.[1,2] These anions are indefinitely stable at room temperature and are observable by n.m.r. spectroscopy. The spectra are sharp with well defined fine structure indicating that fluoride ion exchange processes are not detectable at room temperature on the n.m.r. timescale. Curious chemical shift data are observed and will be discussed. Higher temperature studies, however, indicate line broadening and the threshold temperature for this exchange process is an indication of carbanion stability. This provides an excellent approach to comparing the effect of counterions. Relative stabilities of anions have also been determined by competition experiments, as shown in [2]. These data will be presented, in addition to some of the chemistry of the carbanions shown below.



(1) (2) [1]

ALKENE (A) + ALKENE (B) $\xrightleftharpoons{F^-}$ ANION (A) + ANION (B) [2]

ALKENES	ANIONS
	
	
	
$(CF_3)_2C{=}CF_2$	$(CF_3)_3\bar{C}$
$(C_2F_5)CF_3C{=}CFCF_3$	$(C_2F_5)_2\bar{C}CF_3$
$(CF_3)_2C{=}CF(C_2F_5)$	$(CF_3)_2\bar{C}(C_3F_7)$
	

All unmarked bonds to F.

FLUORIDE ION SOURCES
CsF, KF, $(Me_2N)_3S^+$ $(Me_3SiF_2)^-$ [2,3]

1 A.E. Bayliff, M.R. Bryce, R.D. Chambers and R.S. Matthews, J. Chem. Soc., Chem. Commun., 1985, 1181.

2 W.J. Middleton, U.S. Patent, 3 940 402, 1976.

3 W.B. Farnham and B.E. Smart, Abstracts of papers, 7th Winter Fluorine Conference, Orlando, Florida, February 1985, paper 8.