

## Acetyl Hypofluorite, the First Member of a New Family of Organic Compounds

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**Summary** Some sodium salts in acetic acid–Freon 11 ( $\text{CFCl}_3$ ) when treated with elemental fluorine produce acetyl hypofluorite,  $\text{CH}_3\text{CO}_2\text{F}$ , a new electrophilic fluorinating agent.

THE search for electrophilic fluorinating agents has so far yielded several compounds which all possess a fluoroxy-group attached to a perfluoroalkyl moiety.<sup>1</sup> Except for some theoretical studies on the unknown  $\text{CH}_3\text{OF}$ ,<sup>2</sup> no organic compound with a fluoroxy-group bonded to a non-fluorinated alkyl radical is known. It had always been believed that such compounds would be very unstable because of their

tendency to eliminate HF. Recently, however, it has been shown that  $\text{CF}_3\text{OH}$  is unexpectedly stable, since the distance between the fluorine and the hydrogen atoms is quite large.<sup>3</sup> We thought, therefore, that acetyl hypofluorite,  $\text{CH}_3\text{CO}_2\text{F}$ , (**1**), should be even more stable and thus of use in organic synthesis.

Elemental fluorine does not react with acetic acid and is practically insoluble in it, nor does it dissolve in a mixture of  $\text{CH}_3\text{CO}_2\text{H}$  and  $\text{CFCl}_3$  (Freon 11) at  $-78^\circ\text{C}$ , and thus it does not form an oxidising solution.† When, however, nitrogen-diluted fluorine is passed through suspensions of sodium fluoride, acetate, or trifluoroacetate in acetic acid–

† D. Cech and A. Holy, *Collect. Czech. Chem. Commun.*, 1976, **41**, 3335. The authors stated that they were dissolving fluorine in acetic acid at various concentrations. These fluorine solutions were oxidative and were used for converting uracil into 5-fluorouracil. We, however, were unable to prepare such a 'fluorine solution.' It is possible that various amounts of some salts were present in the reaction mixtures in their experiments, thus forming oxidising solutions owing to the formation of the fluoroxy-moiety which can convert uracil into 5-fluorouracil.

