O_3

ELEMENTAL FLUORINE AS A FLUORINATING AGENT AND AS AN OXIDIZER IN ORGANIC CHEMISTRY

Shlomo Rozen* and Michael Brand
School of Chemistry, Tel-Aviv University, Tel-Aviv 69978 (Israel)

After almost 100 years during which F_2 was hardly used in organic chemistry we have demonstrated that the fear and the prejudice linked to this element are largely unjustified. In the past we have shown that it can activate "impossible" sites in organic molecules, produce a whole range of radical, electrophilic and nucleophilic agents and perform surprising reactions. One of the expected basic reactions of F_2 however, namely its addition to olefinic bonds, got up to now very limited attention. Lately we have found that when the right conditions are applied, fluorine can be added to various types of double bonds to produce the difficult to obtain vicinal difluoro adducts.

Elemental fluorine, however, can be used not only for fluorinations but also for stereospecifically forming epoxides in a surprisingly mild, fast and efficient way. Even olefins, which usually are difficult to epoxidize by any other method, can be succesfully transferred into epoxides in a matter of seconds at 0°C. The scope and the possible mechanism of this unconventional reaction will be discussed.