

THERMAL AND PHOTOLYTIC STABILITIES OF PERFLUOROALKANE SULFONIC ACIDS AND THEIR DERIVATIVES

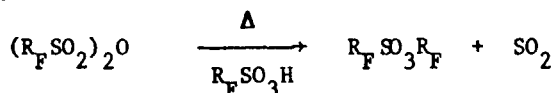
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The use of perfluoroalkanesulfonic acids and their derivatives in drastic conditions leads us to study their behaviour with respect to temperature and radiative factors.

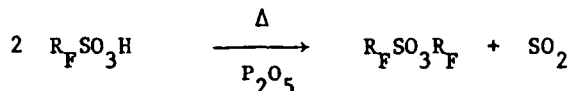
Such acids as  $\text{CF}_3\text{SO}_3\text{H}$  and  $\text{C}_2\text{F}_5\text{SO}_3\text{H}$ , used in a pure state as well as their related pure anhydride are stable until they reach a temperature of at least  $180^\circ\text{C}$ .

On the other hand, the solutions of anhydride with its related acid, yield perfluorosulfonic esters and  $\text{SO}_2$  at room temperature already :



This mechanism is discussed.

These results involve a new and easy synthesis of symmetrical perfluorosulfonic esters  $\text{R}_\text{F}\text{SO}_3\text{R}_\text{F}$  with acids and  $\text{P}_2\text{O}_5$ .



Further more, it occurs no transformation of the anhydride under UV and visible irradiation. But under the same conditions, a small account of acids are deshydrated into anhydrides.

A further experiment combining both effects of temperature and light leads to the esters.