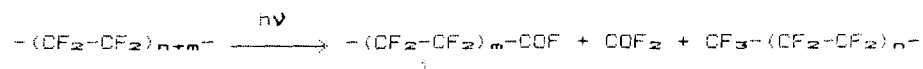


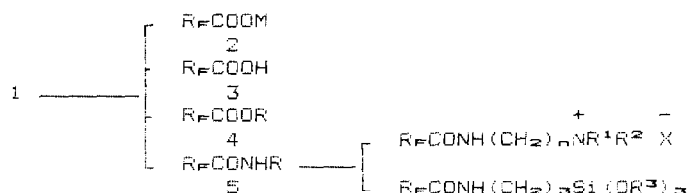
# PREPARATION, CHARACTERIZATION AND END GROUP REACTIONS OF PER- FLUOROALKANOIC FLUORIDES FROM RADIATION INDUCED DEGRADATION OF POLY(TETRAFLUOROETHYLENE)

W.Bürger and K.Lunkwitz  
Institute of Polymer Technology (ITP)  
P.O. Box 411, D-8012 Dresden (F.R.G.)

The macromolecular perfluorinated compounds of formula I  
 $\text{CF}_3-(\text{CF}_2)_n-\text{COF}$ ,  $n=15-200$ , are synthesized by radiation-induced  
partial degradation of poly(tetrafluoroethylene) according to



In addition, derivatives of these products were easily prepared  
by terminal group reactions to anionic, cationic, non-ionic or  
crosslinked structures.



$\text{R}^1, \text{R}^2, \text{R}^3 = \text{methyl, ethyl}$

In the purely ionogenic degradation products 3 the acid groups should have an increasing influence on the structure-property relationships (dissociation and sorption behaviour, ion-exchange capacity) with decreasing molecular weight. A thin layer of carboxylic groups near the surface is connected with a chemical inert non-swellable polymer. Crystallinity, melting behaviour, and composition of the derivatives can be varied. First investigations of the chemistry of perfluoroalkanoic fluorides and electrochemical characterization with regard to type and number of functional groups, investigations of stability, transport behaviour, and changes in the surface load by adsorption experiments of the particles point to interesting exchange properties and film-former properties of these perfluorinated ionomers.