

## THE RADIATION-CHEMICAL DEGRADATION OF POLYTETRAFLUORO-ETHYLENE TO LOW-MOLECULAR AND FUNCTIONALIZED PERFLUORINATED COMPOUNDS

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The action of high energy radiation of relatively low dose in presence of reactive substances leads to a finely grained PTFE powder with functional groups, which can be mixed easily with liquids, solutions and polymers.

The degradation of PTFE by high energy radiation with a high dose in presence of oxygen forms among other compounds perfluorinated carboxylic acids, whereas in inert atmosphere mixtures of perfluorinated alkenes and alkanes of different chain length ranges are obtained. An apparatus conception of a continuous degradation of PTFE was developed.

Irradiation of perfluorinated alkanes and of gaseous degradation products of PTFE leads to a significant increasing of the yield of perfluorinated alkenes. Mechanisms of reactions are discussed. Recombinations of radicals obtained by irradiation form branched molecules. The reactions are diffusion controlled. Irradiation of high molecular PTFE leads to low branching. The degree of branching of molecules increases in correlation to decrease of viscosity of the reaction medium. Compounds with the highest degree of branching are obtained with the irradiation of gaseous perfluorocarbons, and reactions of increase of the carbon chain are observed in this case in a high extent.