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THE POLYMERIZATION OF POLYFLUOROSTYRENES IN A GLOW DISCHARGE

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This work is a study of the processes of polymer formation from isomeric polyfluorostyrenes by glow discharge. The polyfluorostyrenes used were Z-C_6F_4-CX=CFY (I - X=CF_3, Y=Z=F; II - Y=CF_3, X=Z=F; III - X=Cl, Y=Z=F; IV - X=Z=Cl, Y=F; V - X=Y=Cl, Z=F) and perfluoroallylbenzene VI (C_6F_5-CF_2-CF=CF_2).

Synthesized polymers were identified by means of IR-spectroscopy and elemental analysis data. The thickness of polymeric films in kinetic experiments was defined by the microinterferometric method. Compounds I, II and VI are characterized by a faster growth of polymeric films (250-350 Å/s) as compared to compounds III-V (180-200 Å/s). However according to IR spectra polymers from the compounds I, II and VI have fewer fluorinated aromatic rings than from the compounds III-V.

It should be noted that fluorine (or F and Cl) losses per carbon atom are the same all through the above compounds while the oxygen content is different and for polymers from the compounds I, II and VI averages 3 times that from the compounds III-V.

The experimental data obtained reveal the correlation and role of the processes that take place during polymerization in a glow discharge depending on the type of substitute in perfluorinated ring or double connection: condensation of fluoroaromatic rings with breaking of substitutes, double connection polymerization, destruction of fluorobenzen rings resulting in the formation of aliphatic section etc.