

## SYNTHESIS OF NEW "INTELLECTUAL" POLYMERS BASED ON THERMAL POLYPROPYLENE GLYCOLMALEINATE THERMAL POLYMERS WITH METACRYLIC ACID AND ACRYLAMIDE

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Recent years have been characterized by a distinct trend of wider use in the chemistry of high-molecular compounds of special-purpose polymeric materials. In this regard, the attention of researchers working on the creation of new effective compounds with specific properties attract the so-called "smart" polymers. The search for new monomers with the corresponding functional groups for the production of polymers with high water-swelling ability from these positions is an urgent task [1].

Of considerable interest as potential "smart" polymers are co- and terpolymers based on unsaturated polyesters, hardened by ionic monomers of the acrylic series [2]. Given the hydrophobic nature of the unsaturated polyester and the hydrophilicity of the ionic acrylic monomer, a favorable hydrophilic-hydrophobic balance appears in the molecules of co- and terpolymers based on them, which gives hope for the latter to acquire satisfactory moisture sorption properties.

The starting polypropylene glycol maleate phthalate (p-PGMPh) was obtained by polycondensation of maleic and phthalic anhydrides with propylene glycol in a ratio of 0.7: 0.3: 1.1 mol [3].

p-PGMPh terpolymers with methacrylic acid (MA) and acrylamide (AAm) were obtained by copolymerization in dioxane solution in the presence of a benzoyl peroxide initiator ([PB] = 8 mol / m<sup>3</sup>) at an initial ratio of 4: 8: 88, 4:23:73 4:48:48, 4:73:23 and 4: 88: 8 mol.% And a temperature of 333 K for 52 hours.

Samples of the gels were washed with distilled water for 10 days, transferred to a Petri dish and kept in a drying cabinet under reduced pressure to constant weight at 313 K. The synthesized terpolymers were powdery substances from white to light yellow. The composition of the obtained terpolymers was determined by gas chromatography-mass spectroscopy. The equilibrium degree of swelling  $\alpha$  (%) was determined gravimetrically using an LV-210 electronic scale.

During the study of the sorption properties of the obtained terpolymers, it was found that the degree of swelling  $\alpha$ (%) directly depends on the content of the same units of acrylic monomer in their composition. Thus, the maximum swelling capacity is typical for terpolymers with a content of p-PGMPh, MA and AAm, respectively, 3.15:4.55:92.3 and 3.01:79.45:17.54 mol.%. At intermediate values of acrylic monomer (respectively, 2.96:15.33:81.71 and 2.99:65.84:31.17 mol.%), The indicator  $\alpha$ (%) is slightly lower, and it reaches its minimum value when the ratio is monomers 3.08:39.05:57.87 mol.%, i.e. with an initial ratio of ~4:48:48 mol.%. Thus, we can conclude that the highest degree of swelling is characteristic of terpolymer para -PGMPh with MA and AAm with compositions close to the binary systems of p-PGMPh-MA and p-PGMPh-AA, respectively.

### References

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