

POLYMER EPOXY COMPOSITES FOR ELECTROMAGNETIC RADIATION ABSORBING OPTIMAL CHEMICAL COMPOSITION

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Currently, there is a constant increase in electromagnetic radiation sources number. The used frequency range is expanding, and the electronic devices sensitivity to electromagnetic pulses with specified parameters is increasing. In addition, much attention is paid to the problem of finding flexible transparent materials for light-emitting devices' electrodes, solar batteries, and electromagnetic radiation effective shields. In such conditions, tasks related to the materials with controlled electromagnetic characteristics development that allow effective electromagnetic radiation using and its level regulation are very relevant, as well as problems of protection against the electromagnetic signals impact in various frequency ranges.

Such tasks effective solution often involves the polymer composite materials using. As a rule, composite materials consist of a polymer base (matrix) reinforced with fillers that have the necessary properties. By varying the fillers matrix composition, their ratio, the filler orientation, it is possible to achieve the necessary electromagnetic properties (low reflection and high absorption at specified frequencies), reduce the composite mass and thickness.

The purpose of the article is to research the optimal chemical composition of polymer epoxy composites for electromagnetic radiation absorbing with increased set of strength properties.

The objects of the research were:

- epoxy resin based on Epon 828 (USA) and curing agent polyethylene polyamine (USA);
- barium titanate BaTiO_3 . Powder BaTiO_3 (97 wt.% and more of main material) and particle sizes less than 100 mkm;
- humic substances (HS), which were obtained by extraction of brown coal.

The study of impact strength and breaking stress during bending of modified polyamide 6 waste agglomerate of, without notching at a temperature 20 °C, was carried out on a pendulum head according to ISO 180 and ISO 178, respectively.

Due to the modification of epoxy resin by HS there is an increase in strength properties with the optimal content of HS in epoxy resin- HS system is 0,5 % mas. of HS. Further, the systems epoxy resin-HS-MW-barium titanate were studied at the optimal content of HS at the level of 0,5 % mas. and variable content of barium titanate 5 – 20 % mas. From the research data it can be seen that the modification of epoxy resin-HS system in the range of barium titanate content of 5 – 10 % mas. allows to significantly improve most of its strength properties. With a further increase in the content of barium titanate, a decrease in the level of impact strength and breaking stress during bending.