STUDY OF DEFORMATION DEPENDENCE FROM TIME IN POLYETHYLENE TEREPHTHALATE FOR DIFFERENT STATIC LOADS AND IRRADIATION DOSES

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In connection with the widespread use of polymeric materials the volumes of their production have been steadily increasing. World production of plastics increases two times every fifteen years. tns. Moreover, the fastest growing market today is polyethylene terephthalate. Polyethylene terephthalate is a polymer that has revolutionized the world of packaging, radically changing the situation in the world market in the field of production. Industrial polyethylene terephthalate of 90-micrometers thick was selected as the test material. The length of material to be tested was 7 cm and the working part was 5 cm, width – 0.5 cm. The dependence of of deformation from t was recorded. Irradiation of samples was carried out using ELU-6 linear electron accelerator with energy of 2 MeV in air. Irradiation dose was equal to 50 and 100 kGy. Samples of the films were placed at the distance of 40 cm from the output window of the accelerator. The material temperature was 23 °C and the relative humidity was 55 %. Complex experiments were conducted on the deformation dependence from time for different static loads and irradiation doses: 1 = 7; 2 = 10; 3 = 11; 4 = 12; 5 = 14 MPa. It was found that the deformation of the material depends strongly from time and static load. Irradiation of PET samples results in significant improvement in the flexibility, and a significant increase in strain (more than 100 % compared with non-irradiated material), which is associated with degradation of the polymer chains. However, strength is virtually unchanged.

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