

## Track size and track structure in polymer irradiated by heavy ions

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The structure of latent tracks in polyethylene terephthalate (PET) was studied using chemical etching combined with a conductometric technique. Polymer samples were irradiated with Ar, Kr, Xe, Au, and U ions with energies in the range of 1 to 11.6 MeV/u. The etching kinetics of the tracks was investigated in the radii range 0-100 nm. The highly damaged track core manifests itself on the etching curves as a zone where the etch rate changes dramatically and reaches its minimum at a radius of a few nm. It was found that the track core radius is approximately proportional to  $(dE/dx)^{0.55}$ . The track core is surrounded by a halo. In the track halo the etching proceeds at a rate that slowly increases approaching a constant value. Cross linking of macromolecules causes reduction of the etch rate in the halo which extends up to distances exceeding 100 nm in the case of the heaviest ions. Measurable change of the etch rate at such large radii could not be predicted from the shape of the calculated spatial distributions of energy dissipated in tracks. Obviously, formation of the extended track halo is influenced by the diffusion of active intermediates from the track core to the polymer bulk.