

Etching threshold for ion tracks in polyimide

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Tracks of various heavy ions with energies up to 13 MeV/u were studied using the technique of selective chemical etching. It was found that for homogeneous track etching the energy loss of the ions has to surpass a threshold of about 4.50 eV/Å. In a transition regime between 180 and 450 eV/Å etching was possible but the mean diameter of the resulting pores showed a wider distribution than pores at higher energy losses. In order to describe this observation, the radial dose distribution was calculated using a Monte Carlo simulation code. Inhomogeneous etching is interpreted as due to the spatial fluctuations of the deposited energy along the ion path.