

Pore geometry of etched ion tracks in polyimide

Trautmann C, Brüche W, Spohr R, Vetter J, Angert N
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Tracks of energetic heavy ions in the polyimide Kapton were etched in a NaOCl solution. It was found that the pH value of the etchant plays a crucial role for the selectivity of track etching. The bulk etching rate v_b increased exponentially with pH. From the temperature dependence of the bulk etching rate an activation energy of $E_a = 0.74$ eV was deduced. In contrast to v_b , only a slight and linear increase with pH value was observed for the track etching rate v_t . As a consequence, the etch ratio v_t / v_b can be adjusted over one order of magnitude by controlled varying the pH of the etchant. This is a new way to tailor the pore geometry from nearly cylindrical to funnel-shaped pores.