

Poly(vinylidene fluoride)-Based Ion Track Membranes with Different Pore Diameters and Shapes. SEM Observations and Conductometric Analysis

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Poly(vinylidene fluoride) (PVDF) membranes with conical and cylindrical nanopores were prepared in a controlled manner by the ion-track technique, which involved heavy-ion beam irradiation and subsequent alkaline etching. The etching behavior mainly depended on the energy deposition of the ion beams, and thus its depth distribution, estimated by theoretical simulation, was successfully applied to control the shapes and diameters of the etched pores. Scanning electron microscopy (SEM) and electrolytic conductometry provided an insight into the critical experimental parameters. Interestingly, applying a higher voltage to the conductometry cell promoted track etching up to breakthrough probably because electrophoretic migration of the dissolved products occurred out of each pore.