

Influence of a surfactant on single ion track etching: Preparing and manipulating cylindrical micro wires

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The influence of the alkali resistant surfactant Dowfax 2A1 on single ion track etching in 30 μm polycarbonate foils is studied at low etch rate (5 M NaOH at 41.5 ± 2 °C) using electro conductivity measurements. At surfactant concentrations above 10^{-4} vol.% breakthrough times are predictable ($\Delta t/t < 0.25$). At high surfactant concentrations (≥ 1 vol.%) the formation of cylindrical channels is favoured. The shape of these channels (length ≥ 26 μm , diameter ≥ 1.8 μm) is verified by electro-replication and SEM observation of the resulting wires. Agreement of radii is better than 0.1 μm . Depending on the current limit set during electro replication compact or hollow cylinders can be obtained. A technique for localizing and manipulating individual micro wires by their head buds is described.