

## **Gas separation in nanoporous membranes formed by etching ion irradiated polymer foils**

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Polymer membranes with pores with radii in the range of several 10-100 nm were formed by irradiating polyimide foil with highly energetic heavy ions and etching the latent ion tracks with hypochlorite. The aerial density of the pores could be chosen up to an upper limit of  $10^8$  pores  $\text{cm}^{-2}$ , at which too many pores start to overlap. The straight cylindrical pores were tested for their gas permeation and gas separation performance. With a gas mixture of CO and CO<sub>2</sub> as model system, gas chromatographic measurements showed that CO penetrates faster through the membrane than CO<sub>2</sub>, leading to gas separation. This is possible because the mean free path of the molecules is in the order of the pore radius, which is in the transition flow region close to molecular flow conditions.