Applications for Track-etched Templates and Films

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Track etching technology of first generation is mainly used for the production of self-supported membranes made of polycarbonate (PC) or polyethylene terephthalate (PET) with randomly distributed pores. Typical membrane thickness is between 10 and 20 microns and pore size is in the range 0,1 μm to 10 μm.

Second generation track etching technology overcomes many of limitations and offers new advantages : true nanopores down to 10 nm with well-controlled pore shape in a large range of pore densities, use of polymer (polyimide-PI) resistant to high temperature (up to 430 °C), ability to track etch a thin polymeric layer deposited on a substrate (such as glass, quartz, silicon, oxides, ...) and ability to confine nanopores into zones as small as 10 micron square (patterning process). This second generation technology, when applied to larger pore size, also contributes to a better membrane with potential benefits as e.g. a more precise cut-off. Another feature of the second generation technology is the patterning of the polymer layers – i.e. the nanopores can be grown in defined areas of the polymer layers.

Smart membranes are used as separation barriers and flow controllers in devices such as chemical and biochemical sensors and analysers (lab on a chip, microtitre plates, ...). For example, a specific track etched membrane has been designed to be used as a selective separation barrier in a project intends to develop, improve and validate an efficient reliable bioartificial pancreas for human application.

A variety of materials (metals, semiconductors, oxides, heterostructures) can be deposited into the pores as nanowires or nanotubes; these structures can be produced with over wide range of aspect ratios with excellent shape control, and can be either used in-situ or easily harvested by simple chemical dissolution.