

## Nanoporous Membrane with Ultrahigh Selectivity and Flux Suitable for Filtration of Viruses

양승윤, 류인철, 장승기, 김진곤\*

포항공과대학교

(jkkim@postech.ac.kr\*)

Filtration, separation and isolation of viruses have been critical issues in controlling blood-borne viral infection and in virus researches. Production of practical virus filters has been hampered by the difficulties in producing filters with uniform pore size or by the low flux of solution. Here, we describe a new double layered membrane suitable for virus filtration. One layer is an 80 nm thick film having cylindrical pores with diameters of 15 nm and a narrow pore size distribution. This layer is prepared by using a thin film of the mixture of a block copolymer and a homopolymer, and mainly acts to separate viruses. The support layer (~ 150 microns thick) is a conventional micro-filtration membrane with a broad pore size distribution. This asymmetric membrane showed very high selectivity and flux for the separation of human rhinovirus type 14 (HRV 14) which has a diameter of ~ 30 nm and is a major pathogen of the common cold in humans. Since the pore diameter in the top layer can be controlled from 10 ~ 40 nm, this new membrane can be used for filtering, purifying and concentrating viruses for analysis and for preventing viral infection.