

ABSTRACT

HIGH-FLUX HOLLOW-FIBER MEMBRANE WITH
ENHANCED TRANSPORT CAPABILITY AND
PROCESS FOR MAKING SAME

Semipermeable membranes are disclosed for purifying aqueous biological fluids. The membranes are particularly suitable for purifying extracorporeal blood via hemodialysis. The membranes, preferably configured as hollow fibers, are made from a hydrophilic polymeric material, preferably cellulose acetate. Features of the membranes include an ultrafiltration coefficient (K_{UF}) of about 15 to about 55 mL/hr/mmHg/m² (thus termed "high-flux" type membranes), a urea mass transfer coefficient ($K_{ov}(\text{urea})$) of at least 38×10^{-3} cm/min, and a ratio of $K_{ov}(\text{urea})/K_{UF}$ of at least 2.5×10^{-3} . Hollow fibers of such membranes suitable for hemodialysis have a lumen diameter of about 175 to about 210 μm and a wall thickness of about 10 to about 35 μm . According to disclosed methods for making the membranes, a melt comprising about 32 to about 40% w/w cellulose acetate, about 5 to about 10% w/w glycerine, and about 50 to about 67% w/w polyethylene glycol is extruded to make hollow fibers; the fibers are cooled, cold-stretched, water-leached, and replasticized using a glycerine solution.