顆粒型PVDF薄膜之製備、改質及生醫技術上的應用(I)

The effects of the dope dissolution temperature on the membrane structure and physical properties (e.g. tensile strength, thermal behavior, crystal structure, etc.) were studied. It was found that the membranes prepared by dopes dissolved at 50, 70, 90, and 110 degree C exhibited structures composed of globules with sizes being 0.4-0.6.mu.m, 1.5-2.mu.m, 3.5-4.mu.m, and 15-50.mu.m respectively. The tensile strength of the membrane prepared by 50 degree C dissolved dope was the highest while that prepared by 110 degree C dissolved dope was the lawest. The DSC thermal behaviors of all these four membranes were similar. XRD analysis showed that all membranes exhibited the alpha-crystal form; the membrane prepared by the 110 degree C dissolved dope demonsted the most obvious peaks. The membrane were post heat-treated to improve their physical properties. It was found that after annealing at 150 degree C for 1 day, the surfaces of the globules became flattened and some fusion between the globules had occurred. The mechanical strength and crystallinity of the membrane were also increased after heat treatment. And the XRD peaks were more obvious. The properties of the dopes were studied. It was found that the gelation time for dope dissolved at different temperature were also different. For the dope dissolved at 50 degree C it took 7 days to gel, where as for the dope dissolved at 110 degree C, the gelation time was more than 4 months. With increasing standing time, the extent of crystallization in the dope was increased, as revealed by the XRD intensity. The SEM micrographs for membranes prepared by dopes with different standing time indicated that the nucleation density was increased during the standing process; as was evident that the size of the large globules in the membranes were reduced and the small globules became sheet or stick-like crystals.