

SYNTHESIS AND CHARACTERIZATION OF ORGANIC-INORGANIC MEMBRANES

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Organic-inorganic membranes were synthesized via photoinitiated polymerization of acrylonitrile, acrylamide and 3-sulphopropylacrylate potassiums altin the presence of sol-gel system (tetraethoxysilane : ethanol : water). Kinetic parameters of the process of polymerization were determined depending on the amount of sol-gel system added into polymerizing mixture. Water uptake ofobtained materials was found to increase with increasing of sol-gel system content.

Nowadays organic-inorganic membranes (OIM) find growing application in different processes since different functional monomers or polymers are used for their synthesis. In the present work OIMhave beenobtainedviaphotoinitiated radical copolymerization of polymerizing composition (PC) of monomers (acrylamide, acrylonitrile,3-sulphopropyl acrylate potassium salt) and sol-gel system (SGS) on the basis of tetraethoxysilane (TEOS : C₂H₅OH : H₂O). The rate of polymerization process decreases with increasing of the amount of SGS in PC (Fig. 1, Table 1). Water uptake (one of the important properties of membrane) depends on SGS content essentially (Fig 2). Obtained OIM possess ion conductivity and may be used as ion-exchange membranes.

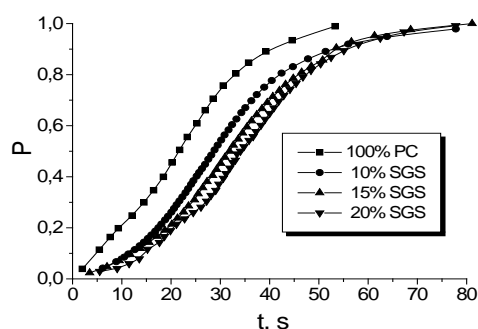


Fig.1.Kinetic curves of polymerization of PC

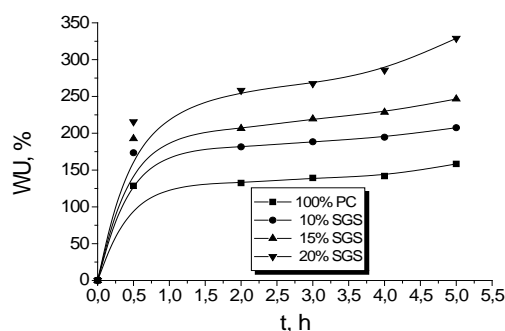


Fig. 2. Water uptake of OIM

Table 1. Kinetic parameters of polymerization process of the system PC : SGS

№	PC : SGS, % vol.	Max. rate w_{max} , s ⁻¹	Time ofachievement of w_{max} , t, s	Conversion at w_{max} , P
1	100 : 0	0.028	20.2	0.456
2	90 : 10	0.030	28.2	0.485
3	85 : 15	0.031	31.9	0.500
4	80 : 20	0.034	36.7	0.560