

## Conductivity performance study of cubic structure Benzene-silica based poly (ether ether ketone) composite membranes

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Sulfonated poly(ether ether ketone) (sPEEK)/ mesoporous benzene-silica electrolyte composite membranes were prepared by a solvent casting method. Components was mixed well in N,N-dimethyl acetamide up to 20wt% of mesoporous benzene-silica powder. Sulfonation degress of sPEEK was 65% and ion exchange capacity of mesoporous material was 0.63 meq./g. By SAXS(Small-Angel X-ray Scattering) and TEM, 3-D cubic-structure ( $Im\bar{3}m$ ) was conformed. And by Nitrogen adsorption-desorption, BET surface area, total pore volume and average pore diameter was determined. The composite membranes showed higher proton conductivity than the pristine sPEEK membrane and the conductivity increase with the temperature but still lower than that of Nafion. On the other hand, the sPEEK based composite membranes showed lower methanol crossover than that of Nafion.