

### Preparation of organic-inorganic polymer hybrids and gas permeation properties

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The organic-inorganic hybrid membranes were formed by sol-gel process on the porous support. In the case of the film coated only APTEOS on PP substrate, the permeability coefficient is 0.0266(Barrer) for nitrogen, 0.109 for oxygen, and 0.00247 for carbon dioxide, while the permeability coefficient of PP film is 0.233, 0.858, and 2.886. Incorporation of organic polymers such as polyvinylpyrrolidone (PVP) and polyethylene glycol(PEG), into the inorganic segments provides flexibility to the matrix. Therefore, the permeability might be increased by addition of organic polymer to APTEOS. The effects of organic polymer on gas permeation properties and selectivities have been investigated and the results are discussed in relation to the molecular weight, and the type and amount of organics. Addition of organic polymer gives the porous structure and results in increase of gas permeability.