

SYNTHESIS AND PROPERTIES OF INORGANIC MEMBRANE

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Abstract

Among the methods of preparation developed, the sol gel process is appropriate to elaborate thin and porous layers with controllable porosity on a wide range of chemically resistant macroporous substrates.

The state of the final products strongly depends on the sol-gel and drying conditions in which it is prepared. Sol-gel techniques are dependent on many parameters.

It is therefore of importance to determine how sol-gel parameters (such as molar ratio of precursor, temperature, nature of precursors, solvent and water...) affect the physical properties (such as surface area and porosity) of membrane.

The physico-chemical phenomena have to be well controlled to obtain crack free microporous layers with good characteristics.

The synthesis of gel is based on hydrolysis-condensation reactions indirectly to form a veritable lattice of oxide from molecular precursors.

Hydrolysis reaction must be controlled to avoid precipitation of hydrous metal oxide. A true oxide network is formed by chemical bonds in the solution.

The structural characterisation was studied by differential thermal analysis, infrared spectroscopy, X-ray diffraction and the textural characterisation by nitrogen adsorption-desorption allowed us to observe the variation of the surface area, porous volume and pore diameters according to temperature.

Scanning electron spectroscopy observation showed homogenous layers without cracking.

In this paper, some experimental results on the synthesis and characterisation of inorganic membrane will be presented.