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Abstract Formulary

Presentation type: **Oral** ✔ **Poster** ☐

Title: Molding Aerogels in Liquids

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ABSTRACT (Space limited to 2200 characters)

A new synthesis method for preparing aerogel films by liquid encapsulation of sol between two immiscible liquids will be presented. This technique enables facile and fast preparation of aerogel films with thicknesses larger than 2 μm and less than 1 mm. This range of thicknesses is currently not feasible due to process limitations. The liquid mold consist a liquid substrate and a liquid cover, each with a suitable density to form a layered structure with the sol. Gelation of the sol occurs while it is surrounded by the liquids, thus, solvent evaporation from the outer surface of the gel is avoided and smooth surfaces are formed. After gelation and aging, the liquids of the mold are removed and the gel is transferred to drying under supercritical conditions. Residues of the liquid mold are washed off completely with the supercritical liquid. The thickness of aerogel films in a liquid mold is determined by the surface tension between the liquids. Therefore, the choice of liquids is critical. With fluorine oil as a liquid substrate and octanol as a liquid cover, homogeneous free-standing silica aerogel films with 160 μm thickness, smooth surfaces, and porosity exceeding 90% were obtained. The porous structure of the films was characterized by analysis of nitrogen adsorption-desorption. In addition, transmittance and haze of the films were measured in the visible range.