

Abstract Submitted  
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**Cellulose aerogel from ionic liquid solution dried by silylation**

DMITRY REIN, YACHIN COHEN, Technion — Aerogels are a class of materials characterised by a highly porous structure with low solids content. There is much interest in cellulose aerogel (aerocellulose) as a biodegradable and sustainable material. Cellulose lyogel can be fabricated from its solution in ionic liquids (IL) by coagulation with a nonsolvent such as water. However, subsequent drying capillary forces in the gel pores that result in severe shrinkage and pore closure. The use of supercritical fluids for drying or freeze-drying entails high equipment and energy requirements. We describe the fabrication and structure of aerocellulose fabricated from IL solution with a simple novel drying process: Addition of a compatible reactive agent (trimethylchlorosilane) and its diffusion into the water-swollen cellulose hydrogel pores results in a reaction with water as well as the pore surface hydroxyl groups. The remaining hydrophobic compound (hexamethyldisiloxane-HMDS), which fills the initially hydrophilic cellulose hydrogel pores, has a low intrinsic surface tension in the pores allowing easy drying with minimal shrinkage. Furthermore it allows modification of the pore surface and even fabrication of cellulose-polysiloxane composites. Relations between aerocellulose processing conditions and the resulting structural features will be discussed.

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