

Design and fabrication of porous materials of polysaccharide aerogels

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Abstract: A variety of approaches for the production and product design of polysaccharide aerogels will be presented. Aerogels of polysaccharides are one of the classes of light-weight open porous materials. Unlike other classical aerogels, they have randomly interconnected nanofibrillar networks and a wide range of pore sizes ranging from 2 to 1000 nm. Aerogels of cellulose, chitin, chitosan, alginate, pectin amidopectin and carrageenan are of great interest in our studies. Different shapes and dimensions of aerogel products have been fabricated using various laboratory techniques. Especially, the macroporous structures have been designed to improve the transport of guest atoms or molecules. The chemical affinity of aerogels to the guest molecules has been enhanced by functionalizing the polysaccharides. These product designs can be tuned with desired properties for specific applications such as templates or supporting materials for bio-composites preparation, purification techniques and bio-medicine.