Bio-aerogels: a new class of versatile and functional biobased materials

Bio-aerogels are one of the classes of aerogel materials that exhibit open-porous nanofibrillar network. They are based on natural polymers such as polysaccharides or proteins. Bio-aerogels are produced by sol-gel synthesis via biopolymer dissolution followed by chain self-assembly and drying with supercritical CO₂. No toxic compounds or processes are involved in bio-aerogel synthesis, and thus they are “human-friendly” materials. In the frame of Nanohybrids project, alginate, cellulose, chitosan and their composite aerogels were prepared on a large scale as particles either by emulsion or Jet-Cutter techniques.

Properties and advantages
Bio-aerogels possess amazing properties such as high porosity (>90%), very low density and high specific surface area (200-500 m²/g). Particle size can vary from few microns to few millimeters.

Application potential
Bio-aerogels can be used as classical aerogels: for thermal insulation, in separation, adsorption and absorption and in catalysis. A strong advantage is that bio-aerogels can also be used in food and feed, in cosmetics and bio-medical and pharma applications as scaffolds, matrices for drug delivery, etc.
CONTACT

Coordinator:
Hamburg University of Technology (TUHH)
Institute of Thermal Separation Processes
Prof. Irina Smirnova | irina.smirnova@tuhh.de
Eißendorfer Str. 38, 21073 Hamburg

Industrial leader:
BASF Polyurethanes GmbH
Dr. Wibke Lölsberg | wibke.loelsberg@basf.com
Dr. Marc Fricke | marc.fricke@basf.de
Dr. Dirk Weinrich | dirk.weinrich@basf.de
Elastogranstr. 60, 49448 Lemförde