Hamburg University of Technology (TUHH)
Institute of Thermal Separation Processes -V8-
Eissendorfer Str. 38, DE-21073 Hamburg

Please fill out the form with the corresponding data for your abstract and send it to: aerogelconference@tuhh.de

In the E-mail you may include other files (e.g. Word, PDF or images).

Abstract Formulary

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

Title: Natural grown Aerogels from Fruits, Vegetables and Mushrooms: Processing and Characterization

Authors: Lara Gibowsky, Baldur Schroeter, Gesine Liese, Julia Husung, Raman Subrahmanyam and Irina Smirnova

Presenting author: Lara Gibowsky

Institution (Presenter): Institute of Thermal Separation Processes

ABSTRACT (Space limited to 2200 characters)

Aerogels are highly porous materials with special properties like a high specific surface area up to 1200 m2 g-1 and low densities of approx. 0.1 g cm-3. Especially biopolymer aerogels (e.g. alginate, chitosan and cellulose) are used due to their high availability, biocompatibility and non-toxicity. The applications of these mesoporous materials are in fields of carrier matrices (food and pharma), thermal insulation and catalyst scaffolds.

Biopolymer aerogel production requires a gelation step, in which the porous network is formed. Gelation is normally carried out in aqueous phase and can be induced via different methods (e.g. change of temperature, pH, addition of ions, etc.), followed by solvent exchange and supercritical drying. Fruits, vegetables, mushrooms and derived plant based food waste show internal three-dimensional pore networks formed by natural growth. Therefore, they can be converted into aerogel-like systems, without requiring a gelation step. The importance of sustainable processes in the (food) industry is growing steadily. In addition to energy efficiency and resource management, this also includes the recycling of food waste and by-products. Hence, the development of an alternative recycling method of food waste to natural grown aerogels is a promising solution to meet the economic requirements.

The aim of this work is to provide an overview of different natural grown aerogels, which are produced based on their naturally aqueous state by solvent exchange with ethanol and supercritical drying at suitable conditions (40 °C and 100 bar). Furthermore, the aerogel-like