

Development of inorganic ultrafiltration layers for membrane reactor applications by Sol-Gel process



DTU Energy is developing, fabricating and testing (dense) inorganic oxygen and hydrogen separation membranes. To be able to separate specific molecules (e.g. proteins, enzymes) from reactions, a specific thin, new inorganic layers with well-defined pore size distribution with a clear cut-off need to be applied on existing membrane support structures. This will require the development of tailor made Sol-Gel chemistry to coat these support structures (e.g porous, metal or ceramic plates or tubes). New and existing coating methods (e.g. spin coating, dip coating or spray pyrolysis coating) will be evaluated. In fundamental studies, the processing parameters in Sol-Gel chemistry will be related to the quality and microstructure (e.g. by SEM, porosimetry) and to the membrane performance of the resulting ultrafiltration layers.

Project type

Topic is suitable for MSc project

Pre-requisite

Preferably knowledge, experience and interest in one of the following areas: ceramic processing and Sol-Gel Chemistry; microstructural characterization of thin porous, inorganic layers (e.g. porosimetry and SEM); inorganic micro and ultrafiltration membranes

Group size

1-2 students, separate projects

Department of supervisors

Main supervisor: DTU Energy

Co-supervisor: DTU Energy, DTU Chemical Engineering

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