3DMM2O Excellence Cluster, KIT

Entrepreneur-minded chemist wanted for tech transfer project!

Commercialization of porous architectures produced by 3D printing

Institute of Biological and Chemical Systems – Functional Molecular Systems (IBCS-FMS / Institute of Organic Chemistry (IOC), Karlsruhe Institute of Technology

We are looking for a candidate for a tech transfer project in Prof. Levkin's working group at KIT in cooperation with Blasco group and Mastalerz group (Heidelberg University). The goal is to commercialize a new 3D printing method developed at the KIT. Candidates should develop a business plan (e.g. market analysis, competition analysis, evaluation of the patent landscape, business model development, etc ...) and have a strong interest in implementing this in the further course or in founding a company. The start would be winter 2021. The duration would initially be limited to 6-12 months. If you are interested, please contact levkin@kit.edu. Ideal candidate should have background in entrepreneurship, business plan preparation, applying for relevant funding and/or with expertise in 3D printing.

Summary of the technology

The ultimate goal of this project is to transfer the technology for 3D printing of porous polymer objects developed within the 3DMM2O Cluster into a commercial product, spin-off company. The developed method for 3D printing porous polymer structures has a number of practically important and novel properties, which can find numerous applications in commercial products. In order to transfer this technology into a product or company, the candidate will have to analyze the market potential, the IP/freedom-to-operate, discuss with potential customers and relevant industry, prepare a business plan, write a proposal for further funding (e.g. EXIST, etc.).

Novel (patented) method for creating inherently porous polymer 3D structures was recently developed at the KIT. The method is based on 3D printing using light-induced polymerization combined with polymerization-induced phase separation. The method was demonstrated using direct laser writing (DLW) as well as digital light projection (DLP) to create both sub-mm or cm-scale 3D porous structures, respectively.

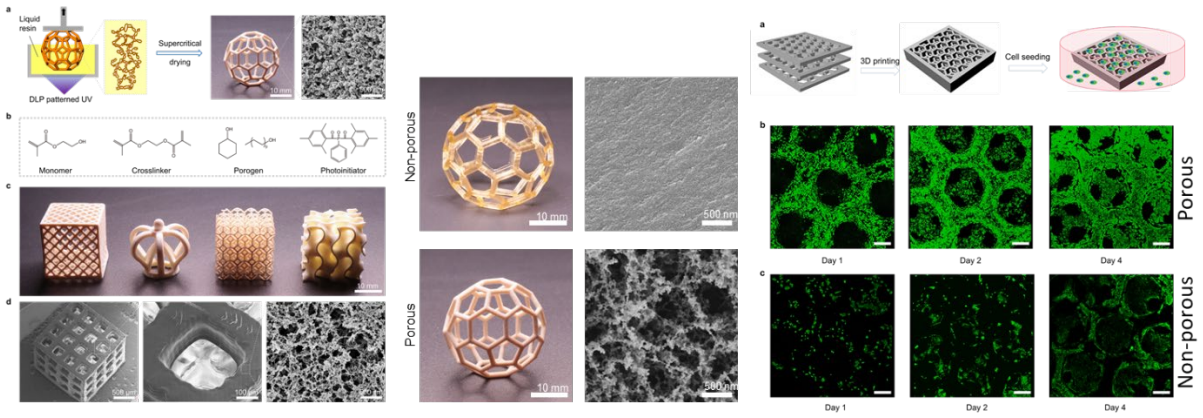

Figure 1. 3D printing of porous polymers by polymerization-induced phase separation.

A. Relevant publications:

- 3D Two-Photon Microprinting of Nanoporous Architectures
  Frederik Mayer, Daniel Ryklin, Irene Wacker, Ronald Curticean, Martin Čalkovský, Andreas Niemeyer, Zheqin Dong, Pavel A Levkin, Dagmar Gerthsen, Rasmus R Schröder, Martin Wegener
  Advanced Materials, 2020, *32*, 2002044. https://doi.org/10.1002/adma.202002044

- 3D printing of inherently nanoporous polymers via polymerization-induced phase separation
  Zheqin Dong, Haijun Cui, Haodong Zhang, Fei Wang, Xiang Zhan, Frederik Mayer, Britta Nestler, Martin Wegener, Pavel A Levkin
  Nature Communications, 2021. https://www.nature.com/articles/s41467-020-20498-1

- 3D printing of superhydrophobic objects with bulk nanostructure
  Zheqin Dong, Maja Vuckovac, Wenjuan Cui, Quan Zhou, Robin H. A. Ras and Pavel A. Levkin, Advanced Materials, accepted

Available workspace and research infrastructure:

All required laboratory and office space as well as potential consumables and infrastructure will be provided by the Levkin Group at the IBCS-FMS.