

ICB PhD public presentations

TEMPLATE-FREE SYNTHESIS OF MACRO-POROUS POLYMERIC MICROCLUSTERS BY REACTIVE GELATION, THEIR POST-FUNCTIONALIZATION BY CLICK CHEMISTRY AND THEIR APPLICATION IN ANTIBODY PURIFICATION

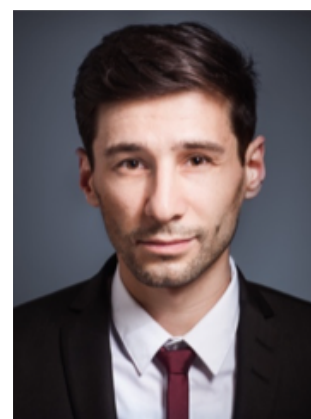
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Co-examiner: Prof. Dr. Mark Tibbitt



ETH Hönggerberg, 19/12/2018, 4 pm, HCI J 4

Project Summary: The production of monoclonal antibodies (mAbs) requires several chromatographic steps to separate the target drug from cellular impurities. However, most of commercial chromatographic materials only exhibit pore sizes up to 0.15 μm resulting in a diffusion-limited mass transfer. We produced macroporous materials with pore sizes of several microns by reactive gelation from azide-bearing polymeric core-shell particles. By employing click-chemistry, ligands such as protein A and ion-exchange brushes could be attached to the polymer surface yielding chromatography resins with relevant functionalities for antibody purification. The obtained materials revealed a convective mass transfer that enabled enhanced purification of mAbs at very high process rates. Overall, the developed approach is expected to provide a new route to the synthesis of chromatography materials through a process easily scalable to industrial productions and quite universal in terms of functionalization ability.

CV. Marcel Lorenz did his BSc in chemistry at TU Berlin and CPE Lyon. Upon finishing his master thesis at the Imperial College London, he obtained a master degree in chemistry from ETH Zurich. Since November 2015 he has been conducting his PhD studies with Prof. Morbidelli.