

Fabrication of Highly-Ordered Interconnected Porous Polymeric Particles and Structures

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Abstract : Porous polymeric materials have attracted a great attention due to their distinctive porous structure within a polymer matrix. They are characterised by the presence of external pores on the surface as well as inner interconnected windows. Conventional techniques to produce porous polymeric materials encounters major challenge in controlling the properties of the resultant structures including morphology, pores, cavities size, and porosity. Herein, we present a facile and versatile microfluidics technique for the fabrication of uniform porous polymeric structures with highly ordered and well-defined interconnected windows. The shapes of the porous structures can either be a microparticles or foam. Both shapes used microfluidics platform to first produce monodisperse emulsion. The uniform emulsions, were then consolidated into porous structures through UV photopolymerisation. The morphology, pores, cavities size, and porosity of the structures can be precisely manipulated by the flowrate. The proposed strategy might provide a key advantage for fabrication of uniform porous materials over many existing technologies.

Keywords : polymer, porous particles, microfluidics, porous structures

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