

Porous ceramics by ice templating: Freezing characteristics, rheological and microstructure properties.

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The aim of the present work is to manufacture porous ceramics exhibiting an unidirectional channels structure. Different processing routes for freeze casting of particle suspension are studied, with a control of the microstructure orientation.

A series of cellular ceramic samples were processed by the ice templating technique. It consists of freezing an aqueous liquid slurry, followed by sublimation of the ice under reduced pressure. Subsequent sintering treatment is carried out to consolidate and densify the channels walls. Obtaining the suitable anisotropic structure is favoured by a perfectly controlled directional solidification step.

Porous zirconia and alumina ceramics with different particles size were investigated. Namely, the influence of processing parameters on the channels size, shape and organization of the obtained samples are assessed as well as the effect of binder addition. The microstructure is studied by micro tomography and scanning electron microscopy

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