

### Synthesis of $\text{TiO}_2$ Inverse Opals in supercritical $\text{CO}_2$

유희민, 문준혁, 유기풍, 임종성\*  
서강대학교

(limjs@sogang.ac.kr\*)

A new method to synthesize ordered macroporous ceramic materials by sol-gel reaction of titanium isopropoxide in  $\text{scCO}_2$  by use of three-dimensional latex array templates is presented.  $\text{TiO}_2$  inverse opals were produced in supercritical carbon dioxide with 3D PS (Polystyrene) latex arrays as templates. The polymeric templates were reacted with Titanium isopropoxide ( $\text{Ti}(\text{OPri})_4$ ) used as precursors of titania and Ethanol in  $\text{scCO}_2$  at certain Conditions. The inverse opal materials obtained after calcinations of the template. The porosity of the materials obtained for each template is different. Furthermore, shrinkage of the network upon condensation in  $\text{scCO}_2$  was small. The synthesis of inverse opals in  $\text{scCO}_2$  overcomes some of the limitations of the liquid-phase techniques, being a faster method of synthesis and, at the same time, rendering materials of unique properties.