Green process for preparing ordered porous titania nanostructure

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In this paper, we suggested the green process for fabricating ordered porous nanostructure by using supercritical fluid. As a reaction medium, we used supercritical carbondioxide($scCO_2$) because of its sustainable advantages; nontoxic, cheap, and nonflammable. It has been much attention to produce ordered porous materials due to its wide range of applications. We chose titanium isopropoxide as a precursor for preparing orderd porous titania nanostructure which named titania inverse opals. By use of three-dimensional latex array templates, sol-gel reaction of in $scCO_2$ is conducted. After calcinations of templates, the inverse opal materials obtained. The porosity of the materials obtained for each template is different. Furthermore, shrinkage of the network upon condensation in $scCO_2$ was small. Scanning electron microscopy(SEM) was used for characterization.