

Synthesis of highly ordered mesoporous transition Metal oxides using hard templates with semiconductor property

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Highly porous materials such as mesoporous silica have generated considerable interests as a consequence of their high surface areas, unusual stability, processability, well developed pores with narrow size distribution. But the Synthesis of mesoporous transition metal oxide is difficult, because of collapse among mesostructures during calcination for removing organic templates.

So we report a synthetic strategy of mesoporous metal oxide using mesoporous silica as template. This nano-casting method using rigid template via high temperature annealing is promises to be an efficient way for the preparation of stable mesoporous metal oxide even after the silica template.

In this work, we have used mesoporous silica as a template for the fabrication of mesoporous metal oxides. And we successfully synthesized various mesoporous metal oxides. Here we especially present mesoporous SnO₂, WO₃ and In₂O₃. It is particularly interesting because it has semiconductor properties and has been widely used as a catalyst for oxidation, gas sensors, rechargeable batteries and optical electronic devices.