Facile synthesis of ordered mesoporous RuO_2 using surface modified KIT-6 as template

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Highly porous materials such as mesoporous materials have generated considerable interests due to the high specific surface areas, unusual stability, well developed porosity with narrow size distributions and potential applications. Here, we report the syntheses of highly ordered mesoporous RuO_2 through a nano-replication route, utilizing ordered mesoporous silica (KIT-6) as the rigid template. Firstly, we have prepared the mesoporous silica with hydrophobic surface by surface modification, and used it as template for the preparation of mesoporous RuO_2. The pore structures of mesoporous RuO_2 can be easily controlled by varying the synthetic conditions such as kind of template, the amount of precursors, etc. We have confirmed the meso-structure of RuO_2 through the XRD, TEM, and N_2 adsorption analysis.
The materials of mesoporous RuO_2 are particularly of interest in the wide fields of applications such as fuel cell, high-energy storage, hetero-catalytic system and super-capacitor.