# Effect of calcination temperature on synthesis of mesoporous thngsten oxide and their catalytic performances in DBT oxidative desulfurization

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A series of mesoporous tungsten oxides were synthesized by using nano-replication method via mesoporous silica KIT-6 as a hard template with different annealing temperatures. The synthesized mesoporous tungsten oxides were well-characterized by X-ray diffraction (XRD), $N_2$-adsorption, Scanning electron microscope (SEM), $H_2$-TPR and Raman spectroscopy. The catalytic activities of mesoporous WOx which were calcinated at different temperatures for the oxidative desulfurization of dibenzothiophene (DBT) with $H_2O_2$ as the oxidant in model oil were also investigated under atmospheric pressure at 50°C. The results showed that the catalytic activity was increased in the order: $WO_x$(400°C)≥$WO_x$(500°C) ≥ $WO_x$(600°C)> $WO_x$(300°C) > $WO_x$(200°C), and the catalytic activity decreases in the order of DBT > BT for the various sulfur-containing compounds (benzothiophene (BT), dibenzothiophene (DBT)). And the activity of mesoporous $WO_3$ was maintained during 5 times recycle-test without any regeneration process. The high catalytic activity and durability is mainly attributed to well-defined mesopores and high surface area of mesoporous $WO_3$ catalyst.