

Mesoporous Metal Oxides from Mesoporous Silica via Nano-Replication

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The mesoporous materials such as α -Fe₂O₃, Fe₂O₃-Mn₂O₃, MnO₂, Mn₂O₃, TiO₂, etc were obtained by the impregnation of metal precursors within the cubic mesoporous silica, crystallization to metal oxides at desired temperature and subsequent silica removal using 1-2M NaOH aqueous solution. The mesoporous metal oxides thus obtained exhibit highly ordered cubic Ia3d mesostructure and high surface areas between 60-200m²/g. The framework structures of the mesoporous metal oxides can be controlled by various factors such as metal precursors, heating temperature, heating period and so on. The characteristics of various Mesoporous Metal Oxides were confirmed by XRD, HRTEM, FESEM, and N₂ sorption.