

# Synthesis, characterization and catalytic applications of mesoporous SBA-15

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## **Abstract:**

Mesoporous silica materials with regular pore structure, such as MCM-41 and SBA-15, have attracted attention because of their applicability as model mesoporous materials in catalysis. The removal of volatile organic compounds from emissions is of considerable interest due to the harmful effects of these pollutants.

Most of the volatile organic compounds are produced from the petrochemical, pressing, and printing industries. The catalytic oxidation is an alternative to the incineration process for the destruction of VOCs. The activity of the catalyst is an important factor for determining the effectiveness of this technique. The transition metal-modified mesoporous SBA-15 silicas are appropriate catalysts for various organic transformations. The catalytic potential for this new class of materials, for example, in the preparation of fine chemicals, is now generating a great deal of interest in their synthesis and characterization.

The results are important in terms of renewable energy and Green chemistry. Sol-gel method, co-precipitation, hydrothermal method and impregnation methods will be used in the preparation of the catalyst. To characterize the materials XRD, SEM-EDAX, TG/DTA, BET, FT-IR, Raman, ESR, UV-Vis., XPS, MASNMR, Cyclic Voltammetry, GC and GC-MS techniques will be used for characterization of the synthesized Inorganic materials and analysis of various dye degradation products.

**Key Words:** SBA-15, MCM-41, Mesoporous silica, pollutants, and incineration.