

Divalent Lacunary Heteropolytungstate $[\gamma\text{-SiW}_{10}\text{O}_{34}(\text{H}_2\text{O})_2]^{4-}$ Supported on MCM-41 as Catalysts for Oxygenation of Organic Sulfides.

Catalytic oxygenation of organic sulfides, especially with 'green' oxygen donors such as H_2O_2 , is an important part of many organic syntheses, desulfurization of fuel, and the deactivation of sulfur containing poison gases such as mustard gas. The divalent lacunary polyoxotungstate $[\gamma\text{-SiW}_{10}\text{O}_{34}(\text{H}_2\text{O})_2]^{4-}$ (**W₁₀**), prepared as a tetrabutylammonium salt, catalyzes this reaction quite efficiently and selectively in homogeneous reactions. However, there are many advantages to heterogenizing any catalyst; most notably including ease of catalyst recovery. These heterogenization agents can be a simple mesoporous material, or they may be functionalized in order to increase their affinity for the catalyst. Mesoporous material, MCM-41, characterized by PXRD and IR, was synthesized and impregnated with **W₁₀**. Simple impregnation of this MCM-41 with **W₁₀** yielded a heterogenized catalyst that deactivated nearly 50% over the course of three subsequent reactions, though in 24 hours all reached over 90% completion. However, upon functionalizing the MCM-41 with (3-aminopropyl) triethoxysilane (APTES) and impregnating with **W₁₀**, the resulting catalyst, though slower, can be successfully recycled at least four times, with approximately similar activity each time, reaching at least 70% completion in 24 hours for each recycle.