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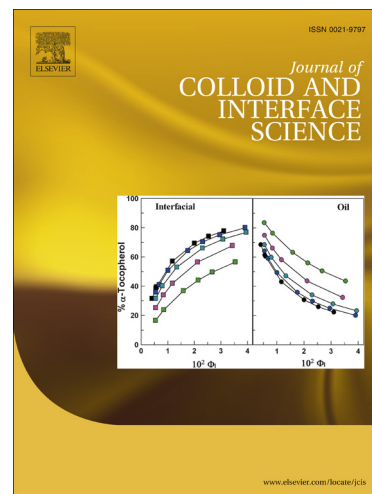
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A Generalized Method toward High Dispersion of Transition Metals in Large Pore Mesoporous Metal Oxide/Silica Hybrids

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ABSTRACT: A series of transition metal acetylacetonates and acetates were used as precursors to generate high loadings of metal sites finely dispersed on SBA-15 silica. To achieve this, grafting of chelated transition metal precursors was performed directly to the surface of the as-synthesized SBA-15/P123 composite material. The thus-obtained Metal/SBA-15 materials were studied by a variety of methods, e.g., elemental analysis, Fourier transform infrared spectroscopy (FTIR), powder X-ray diffraction (XRD), scanning electron microscopy (SEM), diffuse reflectance UV–visible spectroscopy (DR-UV–vis), X-ray photoelectron spectroscopy (XPS) and N₂ physisorption measurements at –196 °C. From the results, the proposed functionalization method was found to be a highly tunable and reproducible strategy to disperse transition metal oxides in mesoporous silica materials. The results from elemental analysis of the modified materials confirmed that the amount of grafted species is a function of the initial concentration of precursor in the solution used for grafting. The chelated complexes were

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