

A Novel Fabrication of Mesoporous Silica Catalysts Coated on Honeycomb for Catalytic Wet Oxidation

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Wastewater from textile processes is highly contaminated with refractory organic pollutants such as dyes, polymers and aromatic compounds. Advanced oxidation processes have been successfully used for the textile wastewater treatment instead of conventional technologies. Catalytic wet oxidation (CWO) has attracted much attention due to their mild operating conditions and high efficiencies in the removal of refractory pollutants. In this study, perovskite-type crystalline metal oxides were supported on mesoporous silica SBA-15 (LaFeCu/SBA-15), followed by coating on secondary support ceramic honeycomb (LaFeCu/SBA/HC) for the development of continuous CWO process. Both powder and honeycomb supported catalysts were characterized by N₂ adsorption, SAXS, SEM, XRD and ICP-AES. catalytic activities were examined in a continuous reactor at an ambient pressure and 90°C using hydrogen peroxide as an oxidizing agent. LaFeCu/SBA/HC catalysts showed more than 73% TOC and 80% COD removal percentages. Experimental results showed that honeycomb catalyst is one of promising candidates for catalytic wet oxidation of textile wastewater.