Treatment and reuse of electronic wastewater using activated carbon based solid-phase advanced oxidation process

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Abstract

Herein, the efficacy of catalysts for solid-phase advanced oxidation processes is evaluated in the removal of low-molecular-weight organics from semiconductor wastewater. To investigate and compare the removal efficiency, experiments were conducted by changing the mixing ratio of a catalyst with activated carbon. As a result, the optimal (Cu + Fe) and (Fe + Al) ratios for the removal of acetone and isopropyl alcohol (IPA) were 8:2 and 9:1, respectively, with activated carbon at pH 3. Over 70\% acetone removal and almost 100\% IPA removal were achieved under acidic conditions. The removal efficiency of both compounds could be maximized using a H\textsubscript{2}O\textsubscript{2} concentration of 4.5 mg/L. Solid-phase advanced oxidation processes were believed to be effective methods to overcome the low adsorbability of organics present in electronic wastewater on activated carbon.

Keywords: Acetone; Electronics wastewater; Isopropyl alcohol; Solid-phase advanced oxidation process

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