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Removal Atrazine Using Two Anion-exchange Resins Supported Nanohydrous Metal-oxide Particle[#]

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Abstract Hydrous iron oxide and hydrous aluminum oxide were loaded successfully onto a polymeric adsorbent (D301) to modify adsorbing materials (HIOD301 and HAOD301). The adsorptive equilibrium of atrazine was investigated in an aquatic environment using HIOD301 and HAOD301 under different experimental conditions. The results indicated that both HIOD301 and HAOD301 showed good adsorption capacities for atrazine at pH 4. The Langmuir and Freundlich isotherm equations were used to study of the interactions between the adsobate and adsorbent. The adsorption kinetics of atrazine at different concentrations was well described in terms of a pseudo-second-order equation in regard to the correlation coefficients and adsorption capacity. The removal percentages of atrazine for HIOD301 and HAOD301 were still more than 95% in the presence of sodium chloride.

Keywords atrazine, adsorption, isotherm, kinetics, solubility

1 INTRODUCTION

Although atrazine (2-chloro-4-ethylamino-6-isopropylamino-s-triazine, Fig. 1) is unsafe for both humans and the environment, it is still widely used as the herbicide throughout the world [1-3]. The emission of atrazine in wastewater is 2-3 times its output. This wastewater, usually containing atrazine, sodium chloride, isopropylamine, monoethylamine and a high concentration of organic byproducts, causes serious environmental pollution. Because atrazine disrupts the production of normal human hormones, it may act as a significant carcinogen in both humans and laboratory animals [4-8]. Therefore, some countries have set maximum contaminant levels (MCLs)

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