

Removal of Cd (II) cation by glycidyl methacrylate- methyl acrylate copolymer modified with benzoic acid from aqueous solutions

Somaieh Mohammadi, Narges Nozad, Mir Jafar Tizmaghz

Abstract

In this work the copolymers of glycidyl methacrylate (GMA) with methyl acrylate (MA) were synthesized by free radical polymerization using azobis (isobutyronitrile) (AIBN) as initiator at 70 ± 1 . Then, copolymers of glycidyl methacrylate have been modified by benzoic acid. The polymers were characterized by H-NMR and FT-IR. Removal of Cd(II) from aqueous solutions by glycidyl methacrylate- methyl acrylate copolymer (GMA-CO-MA) has been performed. Adsorption behavior of Cd onto copolymer was studied by varying the parameters such as contact time, metal ion concentration, solution pH and adsorbent dose. The temperature of 25°C was used throughout. Sorption was rapid. Furthermore, the (GMA-CO-MA) could efficiently remove Cd (II) with high maximum adsorption capacity at pH=7

Key words: Adsorption, Cd(II), Removal, Benzoic acid, glycidyl methacrylate- methyl acrylate

1. Introduction

Cadmium can mainly be found in the earth's crust. It always occurs in combination with zinc [1]. Cadmium also consists in the industries as an inevitable by-product of zinc, lead and copper extraction [2]. After being applied it enters the environment mainly through the ground, because it is found in manures and pesticides [3]. Human uptake of cadmium takes place mainly through food [1]. Foodstuffs that are rich in cadmium can greatly increase the cadmium concentration in human bodies [4]. Examples are liver, mushrooms, shellfish, mussels, cocoa powder and dried seaweed [4]. An exposure to significantly higher cadmium levels occurs when people smoke. Tobacco smoke transports cadmium into the lungs. Blood