Separation of Metal Ions From Aqueous Solutions with Adsorption Method Using Single Walled Carbon Nanotubes

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The pollution of water resources due to the indiscriminate disposal of metal ions has been causing worldwide concern. It is necessary to remove these metal ions from the wastewaters before releasing into the environment. Carbon nanotubes (CNTs) are cylindrical tubules formed by concentric graphitic carbon sheets and capped by fullerene-like hemispheres. CNTs are unique and one-dimensional macromolecules that process outstanding thermal and chemical stability. Many potential applications have been proposed for carbon nanotubes, including conductive and high-strength composites; energy storage and energy conversion devices; sensors; field emission displays and radiation sources; hydrogen storage media; and nanometer-sized semiconductor devices, probes, and interconnects.

Commercial single-walled carbon nanotubes (SWCNTs) were used to as adsorbent to remove heavy metals from aqueous media. In this study nickel and cadmium used as heavy metals and effect of carbon nanotubes amounts and initial metal solutions were investigated. The aim of this study is determined the adsorption capability of SWCNT for heavy metals from aqueous media.

0,05 g SWCNT is the best performance of adsorption percent for cadmium and nickel. When the initial metal concentration increased, the metal percentage of removed from aqueous solution decreased. This adsorption process fitted Freundlich either Langmuir isotherms.

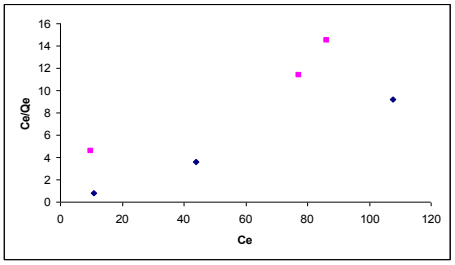

Figure 1. This figure shows that the Langmuir isotherms of cadmium and nickel-SWCNT adsorption at 298 K. The labels in the figure exhibit metals, ■. nickel, ♦. cadmium

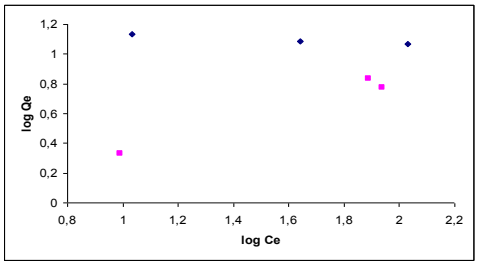

Figure 2. This figure shows that the Freundlich isotherms of cadmium and nickel-SWCNT adsorption at 298 K. The labels in the figure exhibit metals, ■. nickel, ♦. cadmium

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