عنوان مقاله:

Removal of cadmium from water samples using graphene oxide/ magnesium oxide/polyvinylpyrrolidone nanocomposite

محل انتشار:

اولین کنفرانس ملی نانو از سنتز تا صنعت (سال: 1396)

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خلاصه مقاله:

Introduction: Recently, the rapid industrial development is caused to contamination of water by many pollutants especially heavy metals. Wastewater from many industries such as metallurgical, mining, chemical production, and battery manufacturing industries contain many kinds of toxic heavy metal ions. Unlike organic contaminants, heavy metal ions are non-biodegradable, have long half-life and tend to accumulate in living organisms [1-2]. Thus, the removal of heavy metal ions from wastewater before release to the environment is very important. In recent years, adsorption method has widely considered due to the availability, low cost, and high efficiency [3-4]. Nowadays, based on the high reactivity and specific surface area of nanostructures, nanomaterials have been developed a lot in wastewater treatment [5]. Cadmium ion, which is very toxic, has been reported to be one of heavy metal ions causing kidney damage, renal disorder, high blood pressure, bone fracture and destruction of red blood cells [6]. In the present study cadmium ions has been removed from water samples using the GO / MGO / PVP nanocomposite. The effect of different parameters influencing removal process has been investigated. The adsorption isotherm of Cd ions onto the composite was well fitted to Langmuir and Freundlich equation.Experimental: Firstly, Graphene oxide and magnesium oxide were separately synthesized, then polyvinylpyrrolidone was added to the mixture of GO/MGO to obtain the desired nanocomposite.Result and Discussion: The effects of variables such as pH, time contact, sorbent amount, Temperature and stirring rate were investigated and optimized. Concentrations of selective ions under optimized condition were measured by flame atomic absorption spectrophotometry. The effect of interfering ions in the removal process was examined and no evidence of interference was not observed. Furthermore, the proposed nanocomposite was successfully applied for the removal of Cd in the drinking water, well water and industrial waste water.

کلمات کلیدی:

GO / MGO / PVP nanocomposite, Cadmium, flame atomic absorption spectrophotometry

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