

Biosorption of Lead (II) from Lead Acid Battery Industry Wastewater by Immobilized Dead Isolated Bacterial Biomass

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Abstract : Over the past many years, many sites in the world have been contaminated with heavy metals, which are the largest class of contaminants. Lead is one of the toxic heavy metals contaminated in the environment. Lead is not biodegradable, that's why it is accumulated in the human body and impacts all the systems of the human body when it has been taken by humans. The accumulation of lead in the water environment has been showing adverse effects on the public health. So the removal of lead from the water environment by the biosorption process, which is emerged as a potential method for the lead removal, is an efficient approach. This work was focused to examine the removal of Lead [Pb (II)] ions from aqueous solution and effluent from battery industry. Lead contamination in water is a widespread problem throughout the world and mainly results from lead acid battery manufacturing effluent. In this work, isolated bacteria from wastewater of lead acid battery industry has been utilized for the removal of lead. First effluent from the lead acid battery industry was characterized by the inductively coupled plasma atomic emission spectrometry (ICP - AES). Then the bacteria was isolated from the effluent and used it's immobilized dead mass for the biosorption of lead. Scanning electron microscopic (SEM) and Atomic force microscopy (AFM) studies clearly suggested that the Lead (Pb) was adsorbed efficiently. The adsorbed percentage of lead (II) from waste was 97.40 the concentration of lead (II) is measured by Atomic Absorption Spectroscopy (AAS). From the result of AAS it can be concluded that immobilized isolated dead mass was well efficient and useful for biosorption of lead contaminated waste water.

Keywords : biosorption, ICP-AES, lead (Pb), SEM

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