

## Removal of Lead (Pb) by the Microorganism Isolated from the Effluent of Lead Acid Battery Scrap

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**Abstract :** The demand for the lead (Pb) in the battery industry has been growing for last twenty years. On an average about 2.35 million tons of lead is used in the battery industry. According to the survey of supply and demand battery industry is using 75% of lead produced every year. Due to the increase in battery scrap, secondary lead production has been increasing in this decade. Europe and USA together account for 75% of the world's secondary lead production. The effluent from used battery scrap consists of high concentrations of lead. Unauthorized disposal of spent batteries, which contain intolerable concentration of lead, into landfills or municipal water canals causes release of Pb into the environment. Lead is one of the toxic heavy metals that have large damaging effects on the human health. Due to its persistence and toxicity, the presence of Pb in drinking water is considered as a special concern. Accumulation of Pb in the human body for long period of time can result in the malfunctioning of some organs. Many technologies have been developed for the removal of lead using microorganisms. In this paper, effluent was taken from the spent battery scrap and was characterized by inductively coupled plasma atomic emission spectrometer. Microorganisms play an important role in removal of lead from the contaminated sites. So, the bacteria were isolated from the effluent. Optimum conditions for the microbial growth and applied for the lead removal. These bacterial cells were immobilized and used for the removal of Pb from the known concentration of metal solution. Scanning electron microscopic (SEM) studies were shown that the Pb was efficiently adsorbed by the immobilized bacteria. From the results of Atomic Absorption Spectroscopy (AAS), 83.40 percentage of Pb was removed in a batch culture.

**Keywords :** adsorption, effluent, immobilization, lead (Pb)

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