

某廢鉛蓄電池回收工廠附近土壤與空氣鉛污染之流佈

Distribution of Lead Pollution in Soil and Air around A Storage Battery Recycling Plant

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摘要

本文之目的乃在調查研究廢鉛蓄電池回收工廠附近環境之土壤與空氣鉛污染之現況及其濃度之分佈。由環境的數據顯示回收工廠附近之表層土壤鉛之平均含量高於 $1000 \mu\text{g/g}$ ，而遠離該工廠 2 公里左右的較深層土壤(15~30cm)鉛含量下降至小於 $100 \mu\text{g/g}$ 。一般而言，土壤中的鉛含量與該工廠距離之遠近有著極明顯的負相關。另一方面，利用不同之試劑與連續步驟萃取土壤中不同物種的鉛，結果顯示，土壤中的鉛較易以可交換相與碳酸鹽相存在，這可說明源自陸源的鉛回收廠之鉛污染是佔優勢的。該工廠附近環境空氣的鉛平均濃度為 $2.58 \pm 4.17 \mu\text{g}/\text{立方公尺}$ ，(介於 $0.04 \sim 18.2 \mu\text{g}/\text{立方公尺}$)，比背景測站之空氣鉛濃度($0.12 \pm 0.13 \mu\text{g}/\text{立方公尺}$)為高。同時，空氣中高濃度的鉛($5.18 \pm 6.53 \mu\text{g}/\text{立方公尺}$)被發現於晚間採樣的樣本中。

Abstract

The purpose of this study was to investigate the distribution of lead contamination in the environment (such as soil and air) near a storage battery recycling plant. All samples were collected in various seasons during the period from Oct. 1990 to June 1991, and analyzed by atomic absorption spectrometry (flame or graphite). The environmental data showed that the average value of lead in surface soil near plant "X" was $>1000 \mu\text{g/g}$ and decreased to less than $100 \mu\text{g/g}$ in 15-30 cm deep soil about 2 Km away from the plant. In general, the concentrations of lead in soil were strongly and negative by correlated with the distance from plant "X". On the other hand, lead speciation in soil was extracted by sequential procedures using several reagents. The results reveal that lead is preferentially accumulated in the exchangeable and carbonate fractions. This suggests that the lead pollution is dominated synchronously by the storage battery recycling plant. The average concentrations of lead of $2.58 \pm 4.17 \mu\text{g}/\text{m}^3$ (from 0.04 to $18.2 \mu\text{g}/\text{m}^3$) in the air near plant "X" were higher than those at the background stations, the mean value of which is $0.12 \pm 0.13 \mu\text{g}/\text{m}^3$. In addition, the high contents of lead ($5.18 \pm 6.53 \mu\text{g}/\text{m}^3$) in air were found at midnight during a 24 hour period..