

Determination of the content of heavy metals in residues released from manufacturing processes of Ni-Cd batteries by atomic absorption spectrometry

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Abstract – The residues discharged from industry contain a bulk amount of liquid and solid wastes with substantial quantities of toxic heavy metals. These wastes from the industries is not only polluting the water but also the sediment in the adjunct river and ultimately affecting the aquatic life. The objective of this study is to evaluate the heavy metal (*i.e.*, Cd, Cu, Co, Fe, Pb, Mn, Ni and Zn) concentration in solid residue samples released from the manufacturing processes of Ni- Cd batteries. For this purpose samples were digested with aqua regia and analysed for metals by the atomic absorption spectrophotometer (AAS). This study revealed that the metal concentration for Cd, Cu, Co, Fe, Pb, Mn, Ni and Zn were found to be 4200-16500 mg/kg, 140-850 mg/kg, 100-629 mg/kg, 170-630 mg/kg, 150 -920 mg/kg, 30-250 mg/kg, 6400-35000 mg/kg and 110-800 mg/kg respectively. The concentration of heavy metals in residues samples decreased with the following order: Ni > Cd > Pb > Cu > Zn > Co > Fe > Mn. The results of this study provide support for the prevention of human health risks and the control of soil heavy metal pollution. In the industrial area, waste management is one of the difficult and most challenging issue. Sustainable solution is the best fit for dealing with the waste management, because when discharged on the land as well as dumped into the surface water, which ultimately lead to contamination due to accumulation of toxic metals and resultes in a series of problems in living beings, because they cannot be completely degraded.

Keywords – Heavy Metals, Digestion Methods, AAS, Residues, Ni – Cd Batteries, Waste Management