

ABSTRACT

Heavy metals such as lead (Pb), nickel (Ni) and cadmium (Cd) are highly toxic metals that originate in the environment with heavy metal dust due to vehicular emissions on roadways and various industrial chemical productions and operations.

This investigation was carried out to study the chemical and physical characteristics of different settled indoor dust samples collected from selected residences in suburban western province in Sri Lanka. Selected residences in six different locations which were in Kiribathgoda, Gampaha and Hanwella areas were subjected to this investigation. The toxic heavy metals content in different settled indoor dust samples were evaluated for six months period time from August 2007 to January 2008 in selected residences in each location. Indoor dust samples analysed for lead (Pb), nickel (Ni) and cadmium (Cd) indicated remarkably high level of lead and nickel in highly industrialised and urbanised Kiribathgoda area with the maximum lead and nickel content of $65.1 \pm 1.2 \text{ mg kg}^{-1}$ and $30.2 \pm 0.5 \text{ mg kg}^{-1}$ respectively. Therefore, indoor deposition of dust is a major source of heavy metal pollutants which direct to serious environmental hazards. A statistical approach was employed to investigate the correlations between toxic heavy metals in different dust samples collected from different locations.

Analysis of paint chips samples from old houses without being painted for a longer period indicated that those paint chip contained higher amount lead up to $701.4 \pm 8.0 \text{ mg kg}^{-1}$. The experimental data showed that the amount of lead in paint chip samples collected from newly painted houses was relatively low. Therefore, releasing of lead from lead based paint which had been applied in old houses was also one of the major sources for indoor lead depositions. Analysis of heavy metals in different household paints in the Sri Lankan market indicated that the levels of lead in paints analysed varied from $12.4 \pm 0.3 \text{ mg kg}^{-1}$ to $666.1 \pm 13.3 \text{ mg kg}^{-1}$. Therefore, high levels of lead pigments and lead additives are still used by some paint manufacturers in Sri Lanka with increased risk of lead exposure to people. Those high levels of lead paints cannot be recommended for applications, since they have a potential risk of causing health hazards pertaining to lead poisoning in human being.