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**Pre-concentration and determination of trace amounts of heavy metals in beverages marketed in Sri Lanka using naturally occurring clay**

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Heavy metal contamination has become a matter of public health concern, but contamination of fruit juices and soft drinks by heavy metals has not received much attention in Sri Lanka. In this study, a simple, sensitive and accurate pre-concentration method was developed for the determination of trace levels of several heavy metal ions  $\text{Pb}^{2+}$ ,  $\text{Cr}^{3+}$ ,  $\text{Cd}^{2+}$  and  $\text{Cu}^{2+}$  in some beverages marketed in Sri Lanka using naturally occurring clay from Pannala and Mabima areas as the pre-concentration medium. The procedure was based on the retention of the analytes on a  $\text{Na}^+$  homoionic clay bed and then elution from the clay material with a concentrated solution of  $\text{NaCl}$ . The samples eluted were then analyzed using flame atomic absorption spectrometry. The effect of the presence of organic matter in the clay on the pre-concentration was investigated. Non-digested Mabima clay proved to be a better adsorption and pre-concentration medium than Pannala clay. The percentage recoveries for  $\text{Pb}^{2+}$ ,  $\text{Cr}^{3+}$ ,  $\text{Cd}^{2+}$  and  $\text{Cu}^{2+}$  were  $96 \pm 1\%$ ,  $98 \pm 2\%$ ,  $83 \pm 4\%$  and  $94 \pm 2\%$  respectively. The detection limits for  $\text{Pb}^{2+}$ ,  $\text{Cr}^{3+}$ ,  $\text{Cd}^{2+}$  and  $\text{Cu}^{2+}$  were  $0.0010 \text{ mg L}^{-1}$ ,  $0.0050 \text{ mg L}^{-1}$ ,  $0.0040 \text{ mg L}^{-1}$ ,  $0.0002 \text{ mg L}^{-1}$  and  $0.0010 \text{ mg L}^{-1}$  respectively. The developed method was applied for the determination of trace metal ions in beverage samples marketed in Sri Lanka using non-digested Mabima clay. The mean levels of  $\text{Pb}^{2+}$ ,  $\text{Cr}^{3+}$ ,  $\text{Cd}^{2+}$  and  $\text{Cu}^{2+}$  in soft drinks were found to be  $0.0056 \pm 0.0011 \text{ mg L}^{-1}$ ,  $0.0416 \pm 0.0024 \text{ mg L}^{-1}$ ,  $0.0025 \pm 0.0002 \text{ mg L}^{-1}$  and  $0.7037 \pm 0.0374 \text{ mg L}^{-1}$  respectively. The data revealed that mean levels of  $\text{Pb}^{2+}$ ,  $\text{Cr}^{3+}$ ,  $\text{Cd}^{2+}$  and  $\text{Cu}^{2+}$  found in the soft drinks analyzed were within the permissible limits set by CODEX and WHO.

Keywords: Pre-concentration, clay, beverages, heavy metals, FAAS