

## ABSTRACT

LEAD AND OTHER HEAVY METALS IN PAINTS AND ALUMINIUM POTS IN TRINIDAD  
AND TOBAGO

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This project was undertaken in two phases. Phase 1 involved the development a lead test kit, based on the reaction of lead with a rhodizonic acid reagent, to provide a rapid and sensitive indication of the presence of lead in a range of samples. The lead kit developed was effective in detecting lead in paints at levels as low as 0.002 wt% Pb, but was unable to reliably detect lead in soils at <0.8 wt% (8000µg/g), possibly due to the weathered state of the lead in the soil samples. The lead test kit was also used to screen a number of toys in Trinidad for analysis by Flame Atomic Absorption Spectrometry FAAS, with some toys containing high levels of lead. A survey was also done on locally available paints in Trinidad by FAAS, following acid extraction of elad from paint samples. This study confirmed the presence of lead in some of the decorative oil-based (0.39 - 2.9 wt% Pb) and emulsion paints (0.07 - 0.11 wt% Pb). Imported interior &/or exterior latex paints also contained lead, but at levels below the maximum permissible level (MPL) recommended by the Consumer Products Safety Act (0.06 wt% Pb), while imported industrial paints contained up to 0.10 wt% Pb.

Phase 2 involved investigations into both locally manufactured and imported aluminium pots for lead and other heavy metals. Comparison with the BS EN 601: 1995 standard for maximum permissible levels of cadmium, copper, lead and zinc concentrations in aluminium pots indicated that only the pots from China that were manufactured by metal spinning were acceptable for use in contact with food. Aluminium pots from Trinidad, Columbia and Pakistan generally failed to meet this standard.

Leaching experiments with sorrel (*Hibiscus Sabdariffa L.*) extract indicated that aluminium, cadmium, copper, lead and zinc were leached from both local and imported pots, at levels exceeding their stated MPL in the World Health Organization Drinking Water Standards (1993). Although a single treatment with soya bean oil was unsuccessful, a second successive treatment provided an effective, practical and inexpensive measure to allow the pots to meet the WHO standard.

Keywords: lead; lead test kit; paints; aluminium pots; leaching of aluminium pots; treatment of aluminium pots