SPECTROSCOPIC DETERMINATION OF SOME HEAVY METALS PRESENT IN VARIOUS TYPES OF LIPSTICK

[Cadmium (Cd), Nickel (Nl), Lead (Pb), Arsenic (As), Chromium (Cr)]

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ABSTRACT: Cosmetics products are a possible source of heavy metals exposure to human beings. This paperinvestigated the content of heavy metals in various types of lipstick. Product of different brands of lipstick (Expensive and inexpensive) that are found in Bauchi markets were analyzed to determine the concentration of five metals (As, Pb, Cd, Ni and Cr). In these cosmetic have lead content higher than 10ppmof the sample contained nickel by more than 5ppm while furthermore results showed at the concentration of Cr, Cd and Hg are found to be higher of the analyzed sample respectively. Among the different cosmetics produce studies, the highest heavy metal contamination was found in a very cheap brand of lipstick. Our findings call for an instants mandatory regular testing program to check lead cadmium, arsenic, mercury and chromium and other toxic heavy metals cosmetic product imported to Nigerian in order to unit their overabundance and protect customer health.

INTRODUCTION

Lipstick is a cosmetic product containing pigment, oil waxes that apply colours texture and beauty to the lips. China is the source of cosmetics and other produce because of the presence of heavy metals contain in lipstick are toxic to human. As the issue of heavy metals as deliberate cosmetic ingredient of these addressed, attention turns to the presence of these substances as impurities lipstick is a

cosmetics commonly used by women and children has been reported to contain toxic metals.

Heavy metals become toxic when they are not metabolized by the body and accumulate in the soft issues. Heavy metals may enter the human body via food water, air or absorption through the skin in agriculture, industrial or residential settings health risks of heavy metals include reduced growth and good development, cancer, organ damage, nervous system damage and in extreme cases, death. Some toxic element and their compound are absorption extreme cases, death. Some element and their compound are absorption through the skin. On the other hand lipsticks is applied liquid to the lip band, absorption of element into circulation is slower than that of fat soluble substance. Some facial (make up) cosmetics commonly used in Nigeria were analyze for their contents heavy metals; Ar, Cd, Ld, Mr, Nl. The study showed that the small amount of these elements are common in our environment and diet and some are necessary for good health, but large amount of any of them may cause acute or chronic toxicity.

2.0 METHDOLOGY

2.1 MATERIAL AND METHOD

i. Nitric Acid

ii. Hydrochloric Acid

iii. Hydrogen peroxide 30%

iv. Electric Analytical Balance

v. Measuring Cylinder

vi. Microwave

vii. Heating Mantle

viii. Digestion tube 50ml

ix. Fume cupboard

x. AAS

2.2 SAMPLES COLLECTION

Lipsticks samples of most popular brand were collected from the different Markets square within Bauchi metropolitan such as Wunti Market, Central Market and MudaLawal Market and the samples were different qualities and from different qualities and from different manufacturing origin the were arranged into groups according to the nature of the study. They were labeled as Iman Lipstick, Angle Lipstick, New Age Lipstick, Aloe Lipstick, and Military Lipstick samples.

2.3 SAMPLES DIGESTIONS

Samples, 0.5g of sample was accurately measured into a conical flask and 60cm^3 of concentrated nitric acid was added followed by30cm^{3}of hydrogen peroxide 30%

v/v and then 10ml concentrated HCL. The flask was closed for 15 minutes to ensure complete reaction thus beginning the first phase of acid wet digestion.

The resulting mixtures were then heated at 100^0C with a heating mantle until no more brown fumes were observed and consequently allowed to cool. After cooling, 20ml of distilled water was added and the resulting mixture was filtered through a Whatman filter paper 1 into a 100ml volumetric flask and diluted to volume using distilled water before aspiration into the instrument. Digestions were performed in triplicate to ensure accuracy and precision.

3.0 RESULTS AND DISCUSSION

3.1 RESULTS

The heavy metal concentration in each Lipstickwas determined using Atomic Absorption Spectroscopy (ASS) Bulk Model 2010,the concentration of each metalpresent in the sample was the determined by extrapolating the calibration curve in milligrams/kilogram.

Table 1: Concentration in milligrams/kilogram of Cadmium, Nickel, Lead, Arsenic and Chromium in different brand of lipstick available in Bauchi markets

Table 1:

S/N	Sample Description	Cd	Ni	Pb	As	Cr

1.	ILL Lipstick	0.011	0.106	0.378	0.018	0.025
2.	MD Lipstick	0.009	0.014	0.333	0.008	0.035
3.	SM Lipstick	0.011	0.006	0.325	0.013	0.029
4.	KB Lipstick	0.005	0.257	0.361	0.133	0.19
5.	LP Lipstick	0.001	0.113	0.386	0.008	0.082

The value was multiplied by 10 in order to illuminate the graph

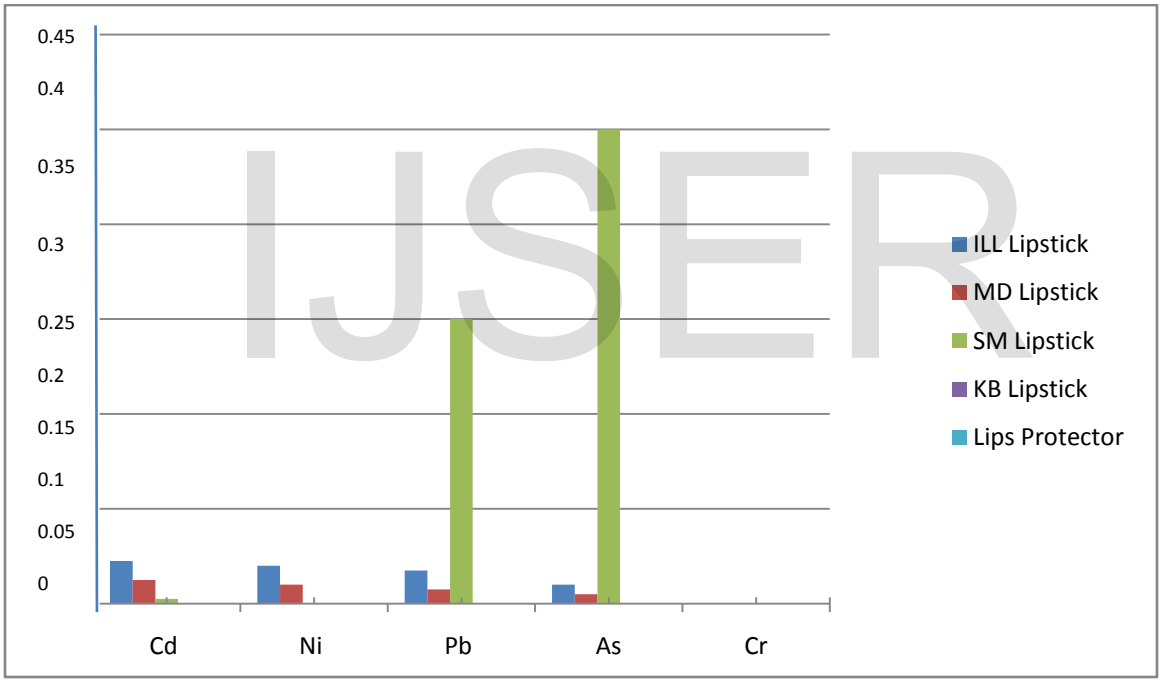

Figure a) comparison concentration ofCadmium, Nickel, Lead, Arsenic and Chromium in different brand of Lipstick available in Bauchi Markets.

Pb> Ni > As> Cr> Cd in all samples

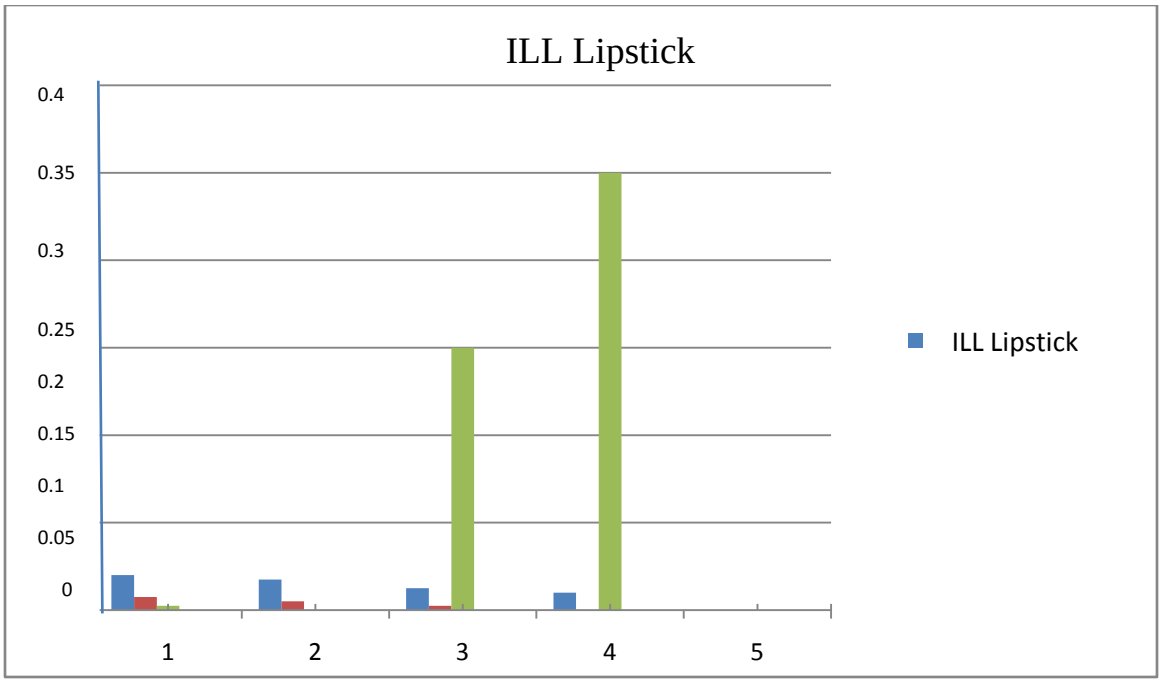

Figure b) Comparison concentration of ILL Pb>Ni>Cr>Cd>As

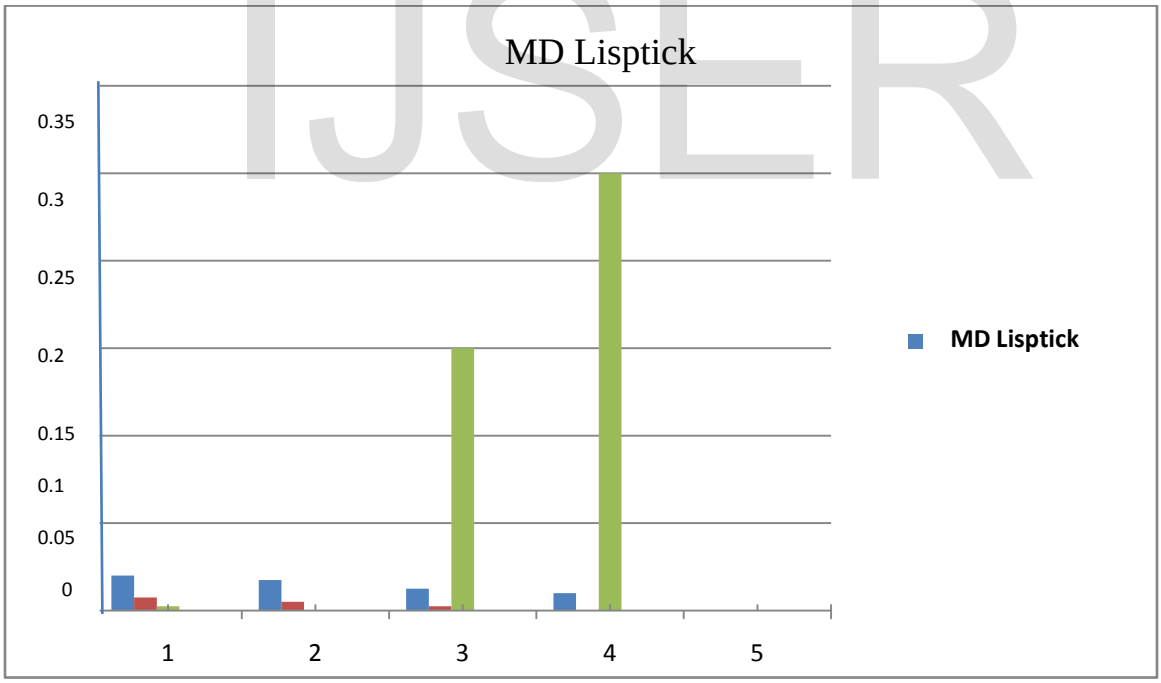

Figure c) Comparison of MD Lipstick Pb>Cr>Ni>Cd>As

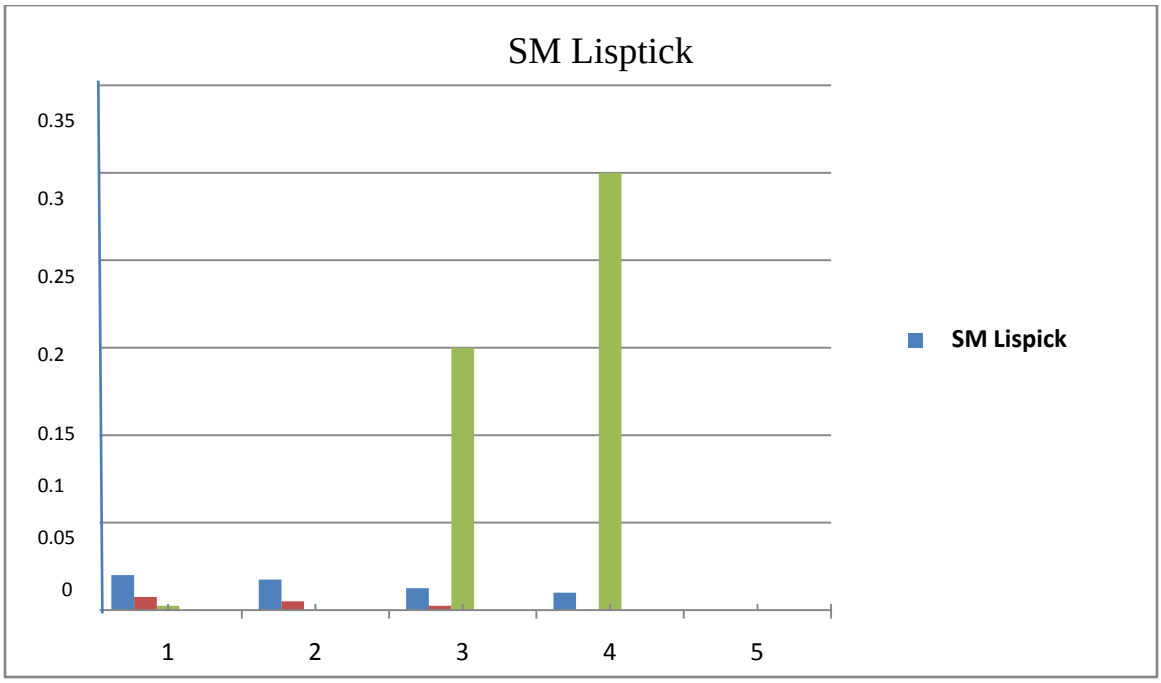

Figure d) Comparison of SM Lipstick Pb>Cr>Cd>Ni

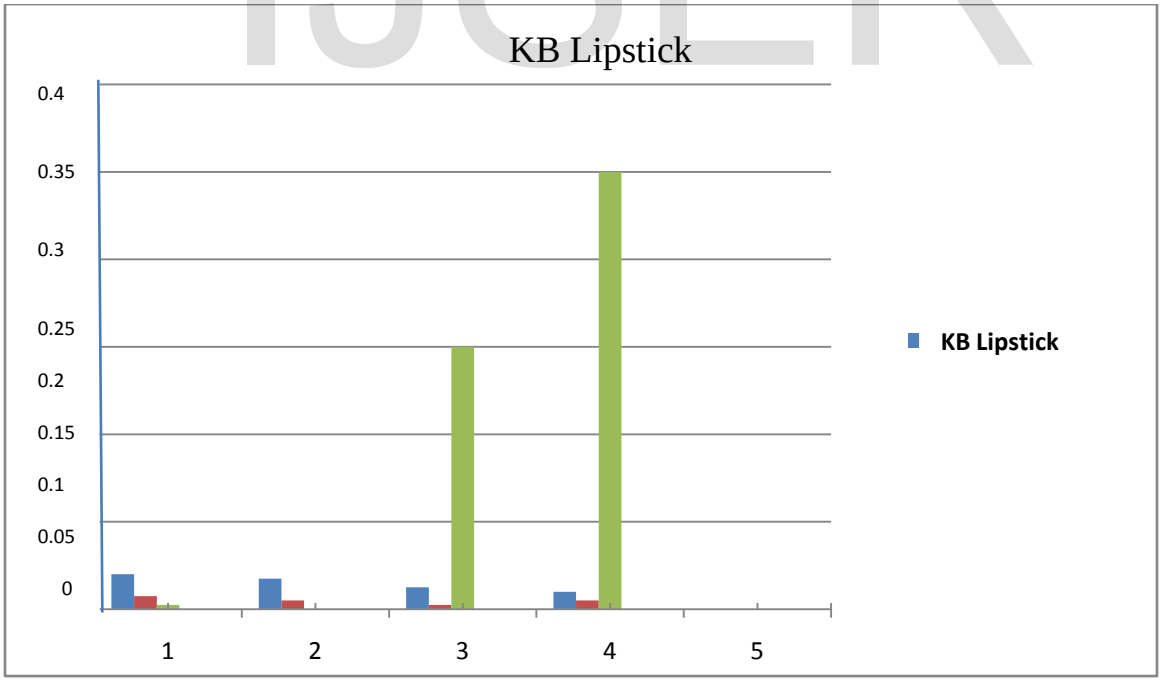

Figure e) Comparison concentration of KB Lipstick Pb>Ni>Cr>Cd

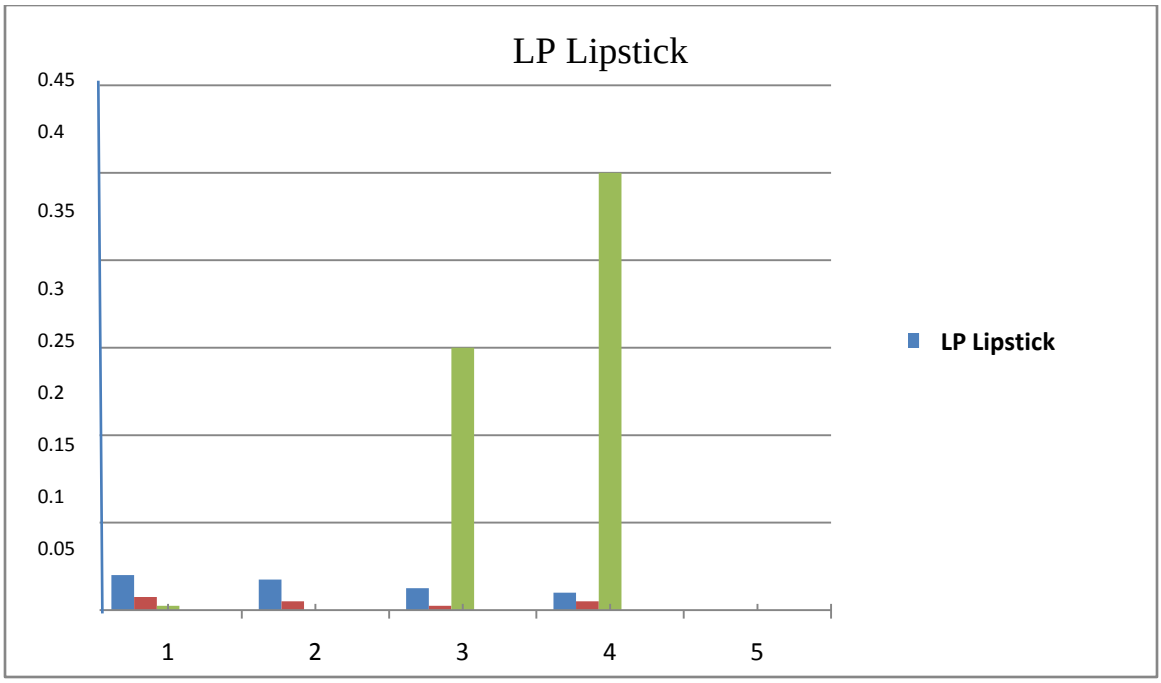

Figure f) Comparison concentration of LP LipstickPb>Cr>Ni>As

4.1 DISCUSSION

It would be worthwhile to know that maximum permissible concentration of heavy metal vary according to sub-population interest as children are more susceptible to heavy metal poisoning than adults (*Nnorman et al, 2005*). Cd poisoning symptoms ranges from renal and cardiac dysfunction, obstructive lung disease, bone detect. (*Adepoju etal, 2012*; *Health Canada 2012*) Pb poisoning symptoms include anomia sterility, learning impairment, behavioural abnormality, decreased hearing (*Duruib et al, 2007; Chauhan et al, 2010*). As poisoning include damage of tissues, organs, chromosomes, immunes and urinary system.

The negative correlation observed in some of the metal some sources and the presence of one dies not necessarily indicate the presence of the others.

4.2 CONCLUSION

This paper has revealed that continuous use of these cosmetics could result in an increased beyond acceptable limits our findings call for an instant mandatory regular testing program to check heavy metal s in cosmetic product that are imported to Nigeria in order to limit their overabundance and protect consumer health. Also efforts should be made at enlightening the users and general public on dangerous involved especially for unknown misbranded products that are pumped in large quantities to the Nigerian markets.

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