

ANALYSIS OF MERCURY IN REGISTERED AND UN REGISTERED COSMETICS USING ICPS (Inductively Couple Plasm Spectrometer)

Farida Suhud
Department of Pharmaceutical Chemistry, Faculty of Pharmacy,
University of Surabaya, Indonesia

INTRODUCTION

Mercury, one of heavy metal elements that has been prohibited by Indonesian Government, is still used in many cosmetic formula. A low concentration of mercury in cosmetic can cause toxic and carcinogenic effects in human. However, these cosmetics are broadly used by teenagers and women because of their interesting package, cheap price and wide availability both in traditional and modern markets. In regards to this issue, this research was designed to determine the level of mercury in some cosmetic products.

METHODS

Determination was performed to eight registered and six un registered cosmetic products which are available in wide-scale markets in Indonesia.

Mercury determination was conducted by wet ashing method and analysed using ICPS Fisons 3410+ instrument.

Standard solution detection by ICPS:

Pipette 1,0 ml of Std.soln Hg 1000 ppm into a 100,0 ml graduated flask

↓

Add demineralised water, then make up to 100,0 ml

↓

Dilute into several concentration
0.2 ; 0.4 ; 0.6 ; 0.8 ; 1.0 ppm

↓

Intensity of Std. soln was observed at 253,652 nm
by ICPS Fisons 3410+ instrument

↓

Regression Curve Equation of Hg Std.soln

Sample detection by ICPS:

Destruction of weighed accurately samples by wet ashing method



Dilute and filter quantitatively into a 50,0 ml graduated flask



Intensity of sample was observed at 253,652 nm
by ICPS Fisons 3410+ instrument



Substitute the intensity of sample
into the regression curve equation of Hg Std.soln



Concentration of Hg in sample

RESULTS

Cosmetic Products	Registered	Un Registered	Hg concentration (%)
Whitening cream X	√		$7.83 \cdot 10^{-3}$
Whitening cream Y	√		-
Foundation A	√		$1.25 \cdot 10^{-3}$
Foundation B	√		$3.40 \cdot 10^{-3}$
Foundation C	√		$6.65 \cdot 10^{-6}$
Two way cake S	√		$3.00 \cdot 10^{-3}$
Two way cake M	√		$4.39 \cdot 10^{-4}$
Two way cake V	√		-
Foundation D		√	0.017
Foundation E		√	-
Foundation F		√	-
Two way cake X		√	$3.95 \cdot 10^{-4}$
Two way cake Y		√	-
Two way cake Z		√	$1.51 \cdot 10^{-3}$

Based on the determination of 14 products, it was found out that the 6 registered products contained mercury. Whitening cream X contains mercury $7.83 \cdot 10^{-3}$ %, while whitening cream Y does not contain mercury more over foundations A,B,C contain mercury $1.25 \cdot 10^{-3}$ %, $3.40 \cdot 10^{-3}$ %, $6.65 \cdot 10^{-6}$ %. Two way cakes S,M contain mercury $3.00 \cdot 10^{-4}$ % , $4.39 \cdot 10^{-4}$ % , while two way cake V does not contain any. On the other hand, the result of determination of 6 un registered products indicated that not all of them contained mercury. Foundation D contains mercury 0.017 %, while foundations E,F do not contain mercury. Two way cakes X,Z contain mercury $3.95 \cdot 10^{-4}$ % , $1.51 \cdot 10^{-3}$ % , while two way cake Y does not contain mercury.

CONCLUSIONS

Mercury level was detected in 9 of 14 products, in which 6 out of 8 registered products are against Health Ministry Regulation of The Republic Indonesia Number 445/MENKES/PER/V/1998 on Substances, Coloring agent, Substratum, Preservative and Sunscreen in Cosmetic and Decree of the Head of National Agency of Drug And Food Control Republic of Indonesia Number HK.00.05.4.1745 on Cosmetic and Regulation of The Head of National Agency of Drug And Food Control Republic of Indonesia Number HK 00.05.42.1018 on Cosmetic Agents.

This research has identified a serious problem amongst the safety of using cosmetic products, 64.29 % of samples contain Hg. This means that there is still a great effort to educate health care workers in producing cosmetics. In line with this, users have to be careful in choosing cosmetics. Such an educational exercise will require considerable commitment from the government, health educators, public health department and publics.