

45/2000

CHENI

THE KENYA POLYTECHNIC

DETERMINATION OF MERCURY AND HYDROQUINONE IN
SKIN LIGHTENING CREAMS SOLD ON THE KENYAN MARKET.

TRADE PROJECT

PRESENTED BY : GEORGE KALABAYI MABONGA

INDEX NUMBER : 401001/743

45/2000

PRESENTED TO : KENYA NATIONAL EXAMINATION COUNCIL

EXAMINATION

CENTRE : THE KENYA POLYTECHNIC

DATE OF

PRESENTATION : NOVEMBER YEAR 2000

ABSTRACT

The aim of the project was to determine the quantity of toxic substances; mercury and hydroquinone in skin lightening creams sold on the Kenyan market. Samples collected, prepared and analyzed showed a low concentration of the toxic substances compared to the WHO standard although there is need for constant checking of the toxicity levels from time and again.

TABLE OF CONTENTS:

Declaration	i
Dedication	ii
Acknowledgement	iii
Abstract	iv

CHAPTER ONE

1.0	Introduction	1
1.1.0	Mechanism of bleaching	2
1.1.1	Mercury of bleaching	2
1.1.2	Hydroquinone	2
1.2.0	Literature Review	3
1.2.1.0	Mercury	3
1.2.1.1	Occurrence of Mercury	4
1.2.1.2	Extraction of Mercury	4
1.2.1.3	Chemical Properties of Mercury	6
1.2.1.4	Uses of Mercury	68
1.2.1.5	Compounds of Mercury	8
1.2.1.5.1	Mercurous compounds	9 -11
1.2.1.5.2	Mercuric compounds	11- 16
1.2.2.0	Hydroquinone	16
1.2.2.1	Occurrence and synthesis of Hydroquinone	17-18
1.2.2.2	Chemical reactions of Hydroquinone	18
1.2.2.3	Uses of hydroquinone	19
1.2.3.0	Toxicity of Mercury and hydroquinone	19
1.2.3.1	Mercury toxicity	19-22
1.2.3.2	Hydroquinone toxicity	22-23
1.3.0	Review of analytical methods	23

1.3.1	Atomic absorption Spectrophotometry	23
1.3.1.1	Principles of absorption spectrophotometry	24
1.3.1.2	Atomic absorption spectrophotometry	24-27
1.3.1.3	Instrumentation	27-30
1.3.1.4	Operation of Atomic absorption spectrometer	30-31
1.3.1.5	Flameless mercury determination	31-32
1.3.2.0	Ultraviolet and visible spectroscopy	32
1.3.2.1	Principles of UV-Visible spectroscopy	33
1.3.2.2	Electronic transitions	34-35
1.3.2.3	Theory of UV-SPECTROPHOTOMETRY	35-39
1.3.2.4	Instrumentation	39-42
1.3.2.5	Reliability of analyses	42-43
1.3.3.0	Objectives	43

CHAPTER TWO:

2.0	Sampling	44
2.1.0.	Requirements	44
2.1.1	Chemical reagents	44
2.1.2	Apparatus	45
2.1.3	Samples to be analysed	45
2.2.1	Standard preparation	46
2.2.1.0	Mercury standards	46
2.2.1.1	Hydroquinone standards	47
2.2.2.0	Sample preparation	48
2.2.2.1	Sample digestion	48
2.2.2.2	Cold vapour generation (Mercury)	48
2.2.2.3	Sample preparation for determination of hydroquinone	48
2.2.2	Sample analysis	49

CHAPTER THREE:

1.0	RESULTS	50
1.1	Table for concentrations and absorbances obtained for Mercury Standards	50
1.2	Result for absorbance of mercury in the samples	50
1.3	Table for mercury concentration in samples	51
1.4	Table showing absorbance of hydroquinone in the samples	51
1.5	Table showing concentration of hydroquinone in the samples	51

CHAPTER FOUR:

4.0	Discussion, conclusion and recommendation	53
4.1	Discussion	53
4.2	Conclusion	53
4.3	Recommendations	54
	References	55-59