

Estimation of heavy metals in human milk by the method of atomic absorption spectroscopy



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LAHORE, PAKISTAN 2017

ESTIMATION OF HEAVY METALS IN HUMAN MILK BY THE METHOD OF ATOMIC ABSORPTION SPECTROSCOPY



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A thesis submitted to the faculty of department of graduate studies in partial fulfillment of the requirements for the degree of MS in Physics.

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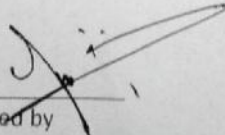
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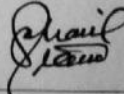
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DECLARATION

I **IMRAN MASEH** s/o **AMANAT MASEH ID: 14004139002**, Session **2014-2016** hereby declare that the matter printed in the thesis titled **“ESTIMATION OF HEAVY METALS IN HUMAN MILK BY THE METHOD OF ATOMIC ABSORPTION SPECTROSCOPY”** is my own work and has not been printed, published and submitted as research work, thesis or publication in any form in any University, research institution etc. in Pakistan or Abroad.

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IMRAN MASEH

DEDICATION

"I dedicate my thesis work to my beloved and honest Father Amanat Maseh and my beloved Mother, to my dear Brothers, and Sisters who are seeing me progressive. My Father and Mother life is role model for me.

ACKNOWLEDGEMENT

*In the Name of **God** who is most Beneficent, most powerful and most Merciful, who guides us in darkness and enlightens our life with happiness after each trouble and difficulty. All thanks for **God Almighty** who is entire source of knowledge and wisdom endowed to mankind and for equipping His humble creatures with mental facilities.*

*My extended gratitude and especial thanks to my Supervisor **Dr. EHSAN ELLAHI KHAWAJA**, Chairperson of the Department of Physics whom superb guidance and research skills make me able to complete my M. Phil Thesis. He has always been a motivation for me to excel my research creative thought.*

*I would like to express my deep and sincere gratitude to my learned **Research Co-supervisor Dr. M. SHAHID NAZIR** Assistant Professor Department of Chemistry COMSATS IIT LAHORE, Mr. ZAMAN TAHIR Research Assistant at Department of Chemical Engineering COMSATS IIT LAHORE, Dr. PETER JOHN, Professor of chemistry, Department of chemistry GC University LAHORE. Mr. JABRAN ALI, Lectuerer in Chemistry at Govt. degree College KAMOKE.*

Finally, I offer my heartily feelings of thanks to my loving parents, brothers and sisters who supported me with lovely attitude and long patience of completing my education and whose sincere prayers invoke my success throughout my life.

IMRAN MASEH

ABSTRACT

The main objects of current work is to find the concentrations of lead, copper and mercury in the milk of human collected from Muridke Pakistan, to investigate the toxic effect of Pb, Cu and Hg with the help of Spectroscopy. Human milk is actually the important part of diet for newborns in Pakistan. Human milk contains essential nutrients and metals required for growth of child. Unluckily, human milk becomes an origin of some poisonous metals in our country and may be hazardous for infants. Absorptions of noxious elements in milk of human were determined by Spectrometry in 16 human milk samples collected from Muridke Pakistan during the 3rd month of lactation. As we know that Muridke is an industrial and over traffic kick city, which has a direct influence of the concentration of lead, Copper and mercury in milk of human. The average concentrations of Cu, Pb and Hg are 0.2208 milli grams per liter (0.1286-0.3856), 0.1897 milli grams per liter (0.1611-0.2356) and 8.2699 micro grams per liter (4.9575-15.5282) respectively. The outcomes of current work shows the Cu, Pb and Hg metals in samples of milk collected from side in Muridke Pakistan are high as compared to suggested values by W.H.O. This is a really threat for the residents of Muridke, which is an industrial and over traffic city Muridke, Pakistan.

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Notations used in this study

Cu	Copper
Cd	Cadmium
Pb	Lead
Hg	Mercury
Cr	Chromium
mg/L	Milligram per liter
µg/L	Microgram per liter
ppm	Parts per million
ppb	Parts per billion
WHO	World health organization
CPN	Central and peripheral nervous systems
BDL	Below detection limit
ATSDR	Agency for Toxic Substances and Disease Registry
AAS	Atomic absorption spectroscopy

CHAPTER-1

INTRODUCTION

1.1 Milk as a complete food

Milk is well thought out as almost immense food. It is worthy source of protein, fat and chief minerals (Enb et al., 2009). Milk and its food stuffs are very common in our food list because of their importance. Since, it is a basis of vitamins and many mineral ingredients which are extremely vital for appropriate growth, working of different tissues and organs. However, overdose of these vitamins or mineral ingredients can be harmful (Farid et al., 2004). Milk digests other kinds of foods before young mammals are given other nutrients. Early breast feeding milk is often the only source of nutrition from the birth of the baby for 5 months. The component of milk differs from species, it has calcium, protein and fat but also some researchers in this field worked for vitamins C in milk. They cannot be low in worth or destroyed. To a lesser extent they move in our bodies through food, drinking water and air. As trace elements, few heavy metals including copper, selenium, and zinc are particularly significant to sustain the human body. Elements such as silver, chromium, cadmium, nickel, lead, zinc, mercury, iron, and cobalt are called heavy metals. Heavy metals cause poisonous to lesser extent or large extent as compared to normal value in the body. Heavy metal could come from drinking water, contamination food, near sources producing emission.