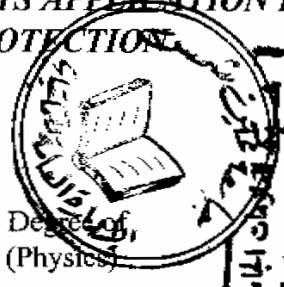
PREPARATION AND DOSIMETRIC PROPERTIES OF LiF(Mg,Cu,P) TLD, AND ITS APPLICATION IN RADIATION PROTECTION



Thesis
Submitted for the Degree of,
Ph.D. in Science (Physics)

By

Mohamed Abdel-Hamid Hussein

Assistant Lecturer,
Radiation Protection Department,
National Center for Nuclear Safety and Radiation Control,
Atomic Energy Authority

Supervision Committee

Prof. Dr.	*Prof. Dr.*
HOSNIA MOHAMED ABU-ZEID	***SAMIRA MAHMOUD MORSY***
Prof. of Nuclear Physics, & Head of Physics Department, Faculty of Girls, Ain Shams University	Prof. of Radiation Physics & Former Vice Chairman of Atomic Energy Authority

To
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Faculty of Girls for Art, Science & Education,
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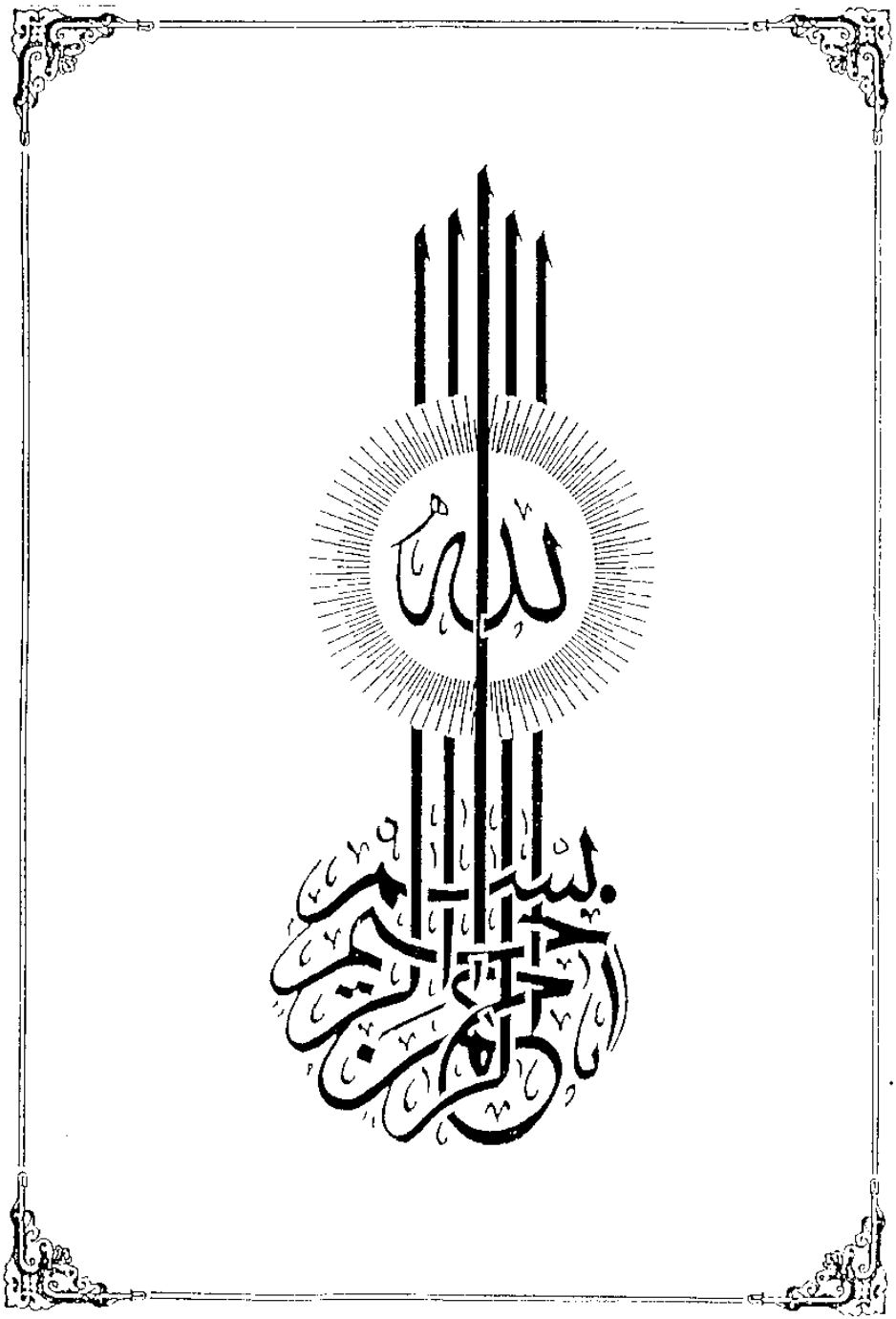

ACKNOWLEDGMENT

First, I thank ***"GOD"***, the Beneficent, the Merciful, for the success of me in the completion of this work.

My grateful thanks are due to the many people who have given of their time and assistance towards the completion of this thesis.

I wish to express my sincere thanks and gratitude to Prof. Dr. ***Samira Mahmoud Morsy***, Former Vice Chairman of Atomic Energy Authority, Former Chairman of the National Center for Nuclear Safety and Radiation Control, Former Head of Radiation Protection Department, National Center for Nuclear Safety and Radiation Control, for suggesting this point of research, her supervision, continuous support, spiritual encouragement, kindly guidance throughout the present work, and trustful help through the experimentation and writing the manuscript.

Special thanks are also due to her for providing me with all required chemicals, practical instrumentations, and separate lab. for the work.

I wish to express my sincere thanks to Prof. Dr. ***Hosnia Mohamed Abu-Zeid***, Professor of Nuclear Physics & Head of Physics Department, Faculty of Girls, Ain Shams University, for her supervision, honest guidance, continuous encouragement and trustful help through the experimentation and writing the manuscript.

I wish to express my sincere thanks to Prof. Dr. ***Abdel-Razik Z. Hussein***, Head of Radiation Control Section, National center for Nuclear Safety and Radiation Control, Atomic Energy Authority, for his continuous support, spiritual encouragement, and his great efforts and helps for providing me with the practical requirements of the work.

I would like to express my deep gratitude and sincere thanks to Prof. Dr. ***Gaber Hassib*** & Prof. Dr. ***Abdel-Azim El-Agramy***, Professors of Physics, Radiation Protection Department, National Center for Nuclear Safety and Radiation Control (NCNSRC), Atomic Energy Authority (AEA), for their trustful help in practical applications and their sincere encouragement.

Acknowledgment

I wish to express my sincere thanks to Dr. ***Hassan Abdel-Hamid,*** National Center for Radiation Research and Technology (NCRRT), AEA, and Dr. ***Arafa Abdel-Hafez,*** National Institute for Standards (NIS), for helping me and providing me with useful specialized books, papers, and informations about the subject of the study.

I also wish to express my sincere thanks to Mr. ***Gamal Gharib Salem,*** Radiation Physics Department, NCRRT, AEA, for his helps in designing a special and urgent accessories required for the experimental work; and to Mr. ***Mostafa Mahmoud Hassan***, Radiation Protection Department, NCNSRC, AEA, for his efforts throughout the experimental work and typing the thesis.

Finally, I wish to express my sincere thanks to the Academic of Scientific Research and Technology for the help given to me during completion of this thesis.

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ABSTRACT

In this thesis, theoretical and experimental studies of the optimum preparation methods have been undertaken for the home-made LiF:Mg,Cu,P thermoluminescent (TL) phosphor for the first time in Egypt. Also, the study of its dosimetric properties, comparing it with that of the standard LiF:Mg,Ti (TLD-100) in order to identify the efficiency of the home-made phosphor.

One of the aims of this thesis is the study of the methods of improving the sensitivity of the home-made phosphor by the conventional methods as well as a new method of "ion bombardment" - that used for the first time for this phosphor (as illustrated in chapter 4).

This thesis includes four chapters in addition to the introduction and conclusion, as follows:

Introduction:

This section includes the different fields for the exposure of man to ionizing radiation. So, the need to a high sensitive dosimeters (phosphors) becomes clear. These high sensitive phosphors can detect the very low dose that are the most widely fields for the exposure of man. This section also shows some efforts and trials of the scientists to have such these high sensitive phosphors according to thermoluminescence methods. Then, the specific features of the thermoluminescent phosphors are shown.

Chapter I:

This chapter contains a review of literature in TLD and it divided into two sections: The first one shows the dosimetric properties of the standard LiF (TLD-100). The second section shows the main efforts and trials of the scientists for preparing LiF:Mg,Cu,P phosphor and their trials for improving its dosimetric properties.