Microdetermination of Active Components in SomePharmaceutical Compounds

Presented by

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(M. Sc.)

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FACULTY OF SCIENCE

CHEMISTRY DEPARTMENT

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Microdetermination of Active Components in Some Pharmaceutical Compounds

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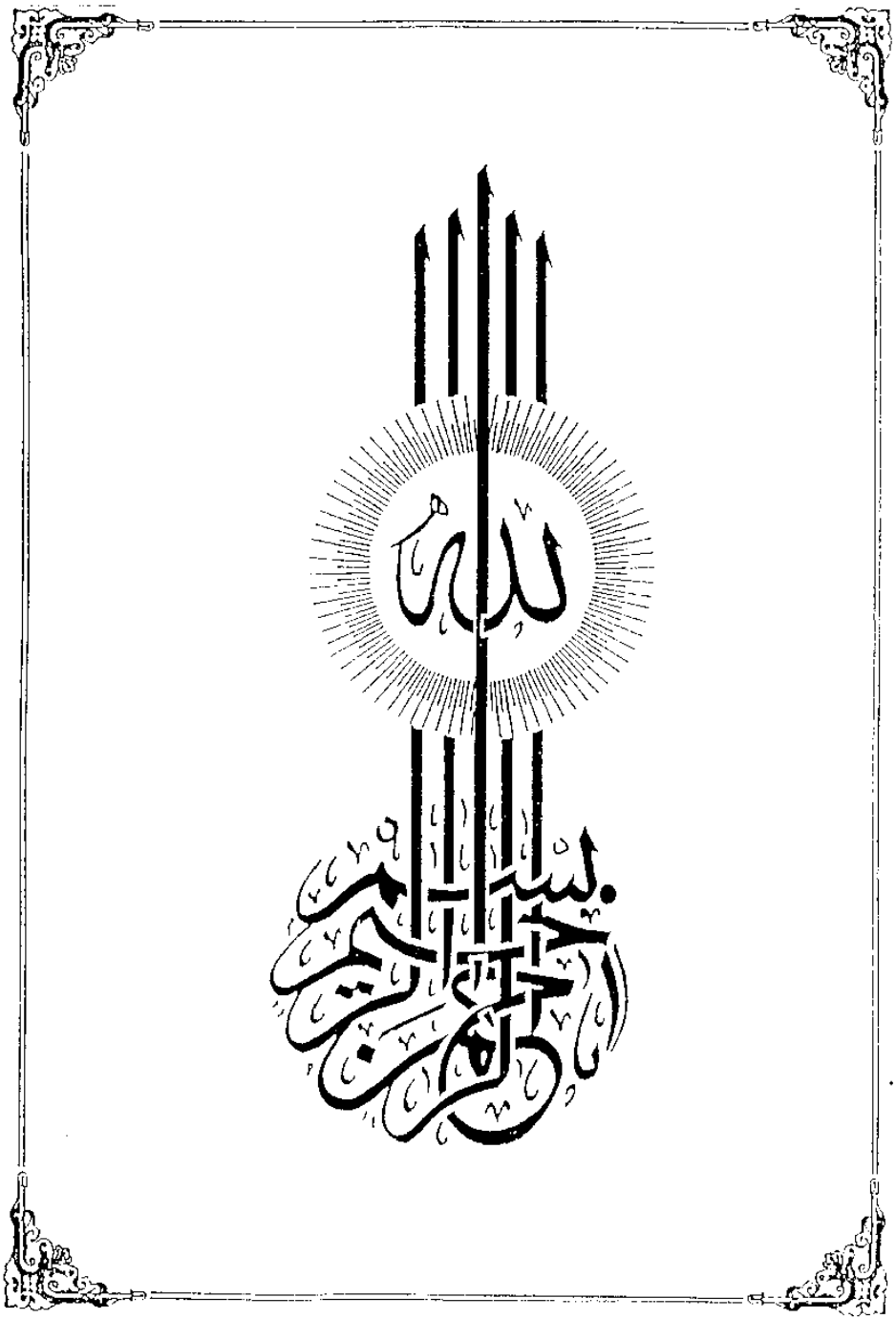

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Dedication

To my family

Abdel-Hameed M. Othman

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PUBLICA

The following papers were ext

Determination of Ranit
Preparations Using Ma
Potentiometry and
Hassan ,S.S.M., Mahmoud
Analytica Chimi

A Novel Potassium Ion
Rifamycin
Hassan ,S.S.M., Mahmo
Talant

Ribonucleic Acid
Potentiometric Membr
Hassan ,S.S.M., Mahm
Talan

Determination of
Preparatio
Spectrofluorim
Hassan ,S.S.M., Ma
Analytica

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PUBLICATIONS

The following papers were extracted from this thesis :

Determination of Ranitidine in Pharmaceutical Preparations Using Manual and Flow Injection Potentiometry and Spectrophotometry

Hassan ,S.S.M., Mahmoud ,W. H.and Othman, A.H. M.,
Analytica Chimica Acta, 1996,**332**,39

A Novel Potassium Ion Membrane Sensor Based on Rifamycin Neutral Ionophore

Hassan ,S.S.M., Mahmoud ,W. H.and Othman, A.H. M.,
Talanta, 1997,**44**,1087

Ribonucleic Acid as a Novel Ionophore for Potentiometric Membrane Sensors of Some Transition Metal Ions

Hassan ,S.S.M., Mahmoud ,W. H.and Othman, A.H. M.,
Talanta, 1997,Submitted

Determination of Metformin in Pharmaceutical Preparation Using Potentiometry , Spectrofluorimtry and Spectrophotometry

Hassan ,S.S.M., Mahmoud ,W. H.and Othman, A.H. M.,
Analytica Chimica Acta, 1998 Submitted

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Abstract

Microdetermination of Active Components in Some Pharmaceutical Compounds

by

Abdel - Hameed Mahmood Othman

The studies presented in this dissertation aimed at development of new, simple, selective and accurate methods for the microdetermination of some active components (e.g., ranitidine, metformin, potassium, copper, cadmium and iron (II)) in some pharmaceutical compounds using different analytical techniques, such as, potentiometry, spectrofluorimetry and spectrophotometry. The thesis is divided into 5 chapters.

Chapter one deals with general introduction covering the theoretical principles and scopes of potentiometry, spectrofluorimetry and spectrophotometry.

Chapter two includes development of methods for determination of ranitidine. A potentiometric technique depending on the preparation of three PVC membrane sensors has been used for direct potentiometric measurements, potentiometric titrations and flow injection analysis of the drug. A spectrophotometric method is also described based on the reaction of ranitidine with sodium nitrite in acidic media to form di-N-nitroso-ranitidine derivative as a chromophore which has reddish color and was used in the determination of ranitidine in pharmaceutical preparations.

Chapter three deals with determination of metformin by potentiometric, spectrofluorimetric and spectrophotometric methods. The potentiometric method based on the preparation

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of three PVC membrane sensors and using these sensors for direct potentiometric measurements, flow injection analysis, and potentiometric titrations of metformin. The spectrofluorimetric method is based on the reaction of metformin with chrysenequinone in strong alkaline media and ∝-naphthol to form a strong fluorophore. The spectophotometric methods are based on the reaction of metformin (MF) with Cu^{2+} to form Cu - MF complex, which is soluble in cyclohexylamine and measurable at 540 nm.

Chapter four describes a novel method for the determination of potassium by using rifamycin – SV drug as selective ionophore for potassium. Plasticized PVC membrane with dibutylsebacate and the neutral ionophore is prepared, characterized and used for quantification of potassium in some pharmaceutical preparations. The sensor gives results agree fairly well with those obtained by flame photometry.

Chapter five deals with the use of ribonucleic acid as neutral ionophore in plasticized PVC membrane for the determination of some transition metal ions (e.g., Cd^{2+}, Cu^{2+}, and Fe^{2+}). Sensors based on ribonucleic acid exhibit Nernstian slopes over a wide range of concentrations and pH values and displays high selectivities and fast response for each of these metal ions. The nature and structure of Cd-RNA complex was studied using elemental microanalysis, x-ray fluorescence, electrophoresis, FTIR and electron microscopy.

Key wards:
Ion-selective Electrodes, Drug Sensors, PVC Membrane, Ranitidine Determination, Ranitidine-Phosphotungstate, Ranitidine-Reineckate, Metformin Determination, Metformin-Tungstosilicate, Metformin-Reineckate, Carboxylated-PVC, Graphite Sensors, Flow-Injection Analysis, Potentiometric Titration, Potassium Sensor, Rifamycin-SV, Ribonucleic Acid Ionophore, Cadmium Sensor, Copper Sensor, Iron (II) Sensor.

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Chapter (2)

Determination of Ranitidine in Pharmaceutical Preparations Using Manual and Flow Injection Potentiometry and Spectrophotometry

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Chapter (3)

Determination of Metformin in Pharmaceutical Preparations Using Potentiometry, Spectrofluorimetry and Spectrophotometry

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