Potentiometric Determination of Calcium Ion using some newly prepared Calcium Ion Selective Electrodes and their Analytical Application

By

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Thesis Submitted to

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Doctor of Philosophy in Chemistry

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Certificate

I certify that the thesis entitled "**Potentiometric Determination of Calcium Ion using some newly prepared Calcium Ion Selective Electrodes and their Analytical Application**" submitted for the degree of **Doctor of Philosophy (Ph.D)** by **Miss. A. Vijayalakshmi** is the record of research work carried out by her during the period from **June 2011** to **June 2014** under my guidance and supervision, and that this work has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship or other titles in this University or any other University or institution of higher learning.

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I declare that the thesis entitled "**Potentiometric Determination of Calcium Ion using some newly prepared Calcium Ion Selective Electrodes and their Analytical Application**" submitted by me for the degree of **Doctor of Philosophy (Ph.D.)** is the record of work carried out by me during the period from **June 2011** to **June 2014** under the guidance of **Dr. (Mrs.) J. Thamarai selvi,** Associate Professor, Department of Chemistry, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore and has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship, titles in this University or any other University or other similar institution of higher learning.

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A. Vijayalakshmi

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ISE	- Ion Selective Electrodes
ppm	- parts per million
PVC	- Poly vinyl chloride
THF	- Tetra hydro furan
mV	- Millivolt
^0C	- Degree Centigrade
E.M.F	- Electromotive force
E^0	- Standard Electrode Potential
DOS	- Dioctyl sebacate
DOP	- Dioctyl phthalate
DBP	- Dibutyl phthalate
NaTPB	- Sodium tetraphenyl borate
Conc.HCl	- Concentrated hydrochloric acid
Conc. H_2SO_4	- Concentrated sulphuric acid
HDTMA	- Hexadecyl trimethyl ammonium bromide
DMA	- Dimethyl formamide
DMF	- Dimethyl acetamide
$CaCl_2$	- Calcium chloride
XRD	- X-Ray diffraction
UV	- Ultra violet spectroscopy
FT-IR	- Fourier Transform Infra red spectroscopy
NMR	- Nuclear Magnetic Resonance spectroscopy
AAS	- Atomic Absorption Spectrometry
EIS	- Electrochemical Impedance Spectroscopy
CPE	- Constant Phase Element
SEM	- Scanning Electron Microscopy
$CaCO_3$	- Calcium Carbonate
NaH	- Sodium Hydride

$MgSO_4$	- Magnesium Sulphate
SMZ	- Surfactant modified Zeolite
GA	- Glutaraldehyde
PBS	- Phosphate buffer solution
Ca-ISE	- Calcium ion selective electrode
HZ	- Hertz
R	- Resistance
Rs	- Solution resistance
Rct	- Charge transfer resistance
Ws	- Warburg diffusion impedance
FIM	- Fixed Interference Method
$(\partial E/\partial T)_p$	- Temperature Co efficient
EDTA	- Ethylene diamine tetra acetic acid
ETH 129	- *N*,*N*,*N*%,*N*%-tetracyclohexyl-3-oxapentanediamide ligand
ETH 500	- Tetradodecylammonium tetrakis(*p*-chlorophenyl)-borate
SMUF	- Simulated milk ultrafiltrate
NaDS	- Sodium dodecylsulfate
ISFETs	- Ion-selective field effect transistors
PEDOT	- Poly (3,4-ethylenedioxythiophene)
PSS	- Poly(styrenesulfonate)
CV	- Cyclic voltammetry
EIS	- Electrochemical impedance spectroscopy
EMIS	- Electrolyte-membrane-insulator-semiconductors
FIA	- Flow-injection analysis
EPMT/GCE	- Electropolymerized melatonin modified glassy carbon electrode
HDDA	- 2,2-hexanedioldiacrylate
nHA	- n-heptyl acrylate
nBA	- n-butyl acrylate
ICMR	- Indian Council of Medical Research