Faculty of Science
Chemistry Department

Preparation of some thiol amine surfactants for sensors fabrication to determine the metal ions in polluted water

A Thesis

Submitted as Partial Fulfillment for Requirements of

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"Chemistry Department"

By

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(B.Sc. 2010)

Faculty of Science
Ain Shams University
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A Thesis for M. Sc. Degree in Organic Chemistry

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Menna tallah Hesham Fathy

Dedication

I lovingly dedicate this work to my Family. ***First****, to my respective Father who has been my constant source of inspiration. He gave me the drive and discipline to tackle any task with enthusiasm and determination.* ***Secondly****, to my sincere husband without his love and support my success would not have been made possible.* ***Next****, to my mother and siblings.* ***Last****, to my encouraging friends, especially to Alaa zidan who has always been a great mentor to me, Mona elrayes and Tahany Mahmoud, thanks for your guidance and advice. I love you all.*

LIST OF ABBREVIATIONS

A_{min}	Minimum surface area per molecule
AAS	Atomic absorption spectrometry
AIBN	Azobisisobutyronitrile
CMC	Critical micelle concentration
CPEs	Carbon paste electrodes
CWE	Coated wire electrode
CWISE	Coated wire ion selective electrodes
DBP	Dibutylphthalate
DOP	Dioctylphthalate
DOS	Dioctylsebacate
FIA	Flow injection analysis systems
FIM	Fixed interference method
FPM	Fixed primary ion method
FTIR	Infrared spectroscopy
GPC	Gel permeation Chromatography
ISE	Ion selective electrodes
MCPE	Modified carbon paste electrode
MPM	Matched potential method
PVC	Polyvinyl chloride
R	Universal constant
RE	Reference electrode
RSD	Relative standard deviation
SPEs	Screen printed electrodes
SSM	Separate solution method
THF	Tetrahydrofuran
TPB	Tetraphenylborate
TSM	Two solution method

π_{CMC}	Effectiveness
E^{o} cell	Standard cell potentials
o-NPOE	o-Nitrophenyl octyl ether
TCP	Tricresylphosphate
Γ_{max}	Surface excess concentration

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Aim of the work

This thesis mainly aims to prepare some aminothiol surfactants such as, poly-3-(hexadecylthio)-N-hexadecylacrylamide, poly-3-(dodecylthio)-N-hexadecylacrylamide, poly-3-(hexadecylthio)-N,N-bis(2-hydroxylethyl)acrylamide, Poly-3-(dodecylthio)-N,N-bis(2-hydroxyethyl)acrylamide, (Z)-3-(hexadecylthio)-N,N-bis(2-hydroxyethyl)acrylamide, (Z)-3-(dodecylthio)-N,N-bis(2-hydroxyrthyl)acrylamide, poly-3-(hexadecylthio)-N-dodecylacrylamide, poly-3-(dodecylthio)-N-dodecylacrylamide. After the preparation, their structures were confirmed by different methods. The first and second of the prepared compounds were used as ionophores to prepare modified carbon paste electrode. It was hoped to propose sensitive, accurate and reproducible electoanalytical method of analysis that can be used for the determination of chromium(III) ions in tab water, river water and formation water samples. The work has focused on the following: Testing the performance of the modified CPEs for the potentiometric determination of Cr(III) in tab water, river water and formation water samples. The performance of such

sensors in the potentiometric determination of Cr(III) ions compared with the atomic absorption spectrometric method.