

ABSTRACT

Name of the scholar: Babu Lal Swami

Supervisor: Dr. Saiqa Ikram

Faculty of Natural Sciences

Department of Chemistry

Topic of thesis: Separation of Metal Ions by PVC Based Ion Selective Electrodes

Containing Schiff Base Complexes

Keywords: Metal ions, PVC, ISE, Schiff Base, CMCPE, Copper, Zinc, Cobalt

This thesis presents the design, fabrication and testing of Poly (Vinyl Chloride) (PVC) embedded ion selective electrodes (ISEs) for which the syntheses of new Schiff base complexes as an Ionophores and their respective characterizations are among the key features to read on. In first chapter "*Introduction and Literature Review*", an extensive review about the establishment to the ion selective electrodes and a brief history and relative advancement has been recorded. In addition a brief record about physico-chemical and electrochemical properties of ISEs and proposed work plan has also been added. In the chapter 2, the synthetic procedures of three new Schiff base ligands have been reported. Their complexation with respective metal ions has also been described. In the chapter 3, the fabrication process of sensors had been discussed in detail.

Chapter 4, The newly synthesized Schiff base ionophore (L_1) was used in fabrication of CMCPE and simple ISE. The newly synthesised Schiff base Ionophore (I_1) was used in fabrication a novel CMCPE for assign zinc ions in chapter 5. The CMCPE responds to Zn(II) ions in a Nernstian behaviour slope at 29.44 ± 0.12 mV decade.⁻¹ In chapter 6, The newly synthesized Schiff base ionophore (Q_1) was used in fabrication a novel CMCPE for assign Cobalt ions.

To conclude, an optimised fabrication route for the specifically designed ion selective electrodes is reported in this work. These sensors devices are intended for use in the applications of detecting the movement of key ions that are involved in determinations of pollutions content in water and soil in real time. Suitable ionophores that selectively detect Cu^{2+} , Zn^{2+} and Co^{2+} sensor devices.