

## A Solvent Polymeric Membrane Ion-Selective Electrode Based on N, N'-bis(Salicylaldehyde)-4-Chloro-O Phenylenediamine Ligand

MIS Kumarasinghe<sup>1</sup>, H Perera<sup>1#</sup> and A Tillekaratne<sup>1</sup>

<sup>1</sup> Department of Chemistry, Faculty of Science,  
University of Colombo

# hasini.perera@sci.cmb.ac.lk

Schiff bases are one class of supermolecules that has their applications in biochemical and analytical reagents. They have proven to play an important role as ionophores of potentiometric membrane sensors which are used for selective determination of both the cations and anions in environmental and biological samples. This study developed a solvent polymeric membrane electrode using N, N'-bis(salicylaldehyde)-4-chloro-o-phenylenediamine (a salophen type Schiff-base) as a neutral ionophore. The membrane consists of a poly (vinyl chloride) matrix with 2-nitrophenyl octyl ether (o-NPOE) as plasticizer and Potassium tetrakis(4-chlorophenyl)borate (K-TCPB) as ion-exchanger. The potentiometric response of the electrode towards the metal ions: K<sup>+</sup>, Ni<sup>2+</sup>, Co<sup>2+</sup>, Cu<sup>2+</sup>, Cr<sup>3+</sup>, and Pb<sup>2+</sup> were investigated in the aqueous medium. Based on the results, the selectivity pattern and the observed slopes of the calibration sensor is as follows: Co<sup>2+</sup> (16 mV/dec) < Ni<sup>2+</sup> (23 mV/dec) < Cu<sup>2+</sup> (33 mV/dec) < K<sup>+</sup> (49 mV/dec) < Pb<sup>2+</sup> (39 mV/dec) < Cr<sup>3+</sup> (73 mV/dec). As observed Cr<sup>3+</sup> shows a super-Nernstian response and the stability was quite low as well. Therefore, the sensor was characterized using Pb<sup>2+</sup>. The membrane electrode demonstrated a Nernstian response of 33mV/decade over the concentration range of 1 x 10<sup>-8</sup> to 1 x 10<sup>-1</sup> moldm<sup>-3</sup> of Pb<sup>2+</sup>. Therefore, the sensor can be used to determine very low concentrations of Pb<sup>2+</sup> ions.

**Keywords:** carrier based ion-selective electrodes, poly(vinylchloride) membranes, schiff-bases as ionophores