

# Synthesis of $\text{Cu}^{2+}$ and $\text{Zn}^{2+}$ Complexes of thiosemicarbazide based Schiff Bases and their Application as Chemical Sensor

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**Abstract**—This study was an attempt to synthesize a new class of Schiff base imines and metal complexes for their use in the fabrication of ion selective electrode membrane (ISE's), which can be used as an electrochemical sensor for different cations/anions.

The present study has been replacement of various analytical techniques viz. AAS, Ion chromatography etc. one of the innovative trends in the present time. The development of electrochemical sensors for direct monitoring of key ions, gases and biochemicals in complex biological samples is a rapidly growing avenue of research.

A chemical sensor detects the presence of specific chemical or class of chemicals in a sample. Among the various classes of chemical sensors ISEs are one of the most frequently used potentiometric sensor. ISEs are mainly membrane based indicator electrodes which are capable of selectively measuring the activity of a particular ionic species. Potentiometric sensors have found vast range of important applications in the field of clinical, industrial, pharmaceutical, environmental monitoring, process control and agricultural analysis. Potentiometric detection based on ISEs offer several advantages over other methods of analysis such as speed, ease of preparation, simple instrumentation, relatively fast response, wide dynamic range, reasonable selectivity and low cost.

The objective of this work is to develop ion selective membrane electrodes which can respond selectively to analyte ion in presence of other ions. The work is based on the synthesis of Schiff base ligands of thiosemicarbazide with different ketones and their complexation with metals such as  $\text{Cu}^{2+}$ ,  $\text{Pb}^{2+}$ ,  $\text{Zn}^{2+}$  &  $\text{Ni}^{2+}$  for their utilization as an analytical reagent (electroactive material) in the development of PVC membrane, which may be used as ISEs to detect a particular ion in solution

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