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European Chemistry Congress

June 16-18, 2016   Rome, Italy

A novel iron(II) selective membrane electrode based on 2-cyanomethyl N-methyl-N-phenyl dithiocarbamate and its applications

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A novel iron (II) selective membrane electrode based on 2-cyanomethyl N-methyl-N-phenyl dithiocarbamate and its applications: Iron has a vital role in all living systems including transportation and storage of oxygen, electron transport and production of enzymes. It can be hazardous for health if its concentration has excess level in the body causing liver and kidney damage, irritation in stomach. Also, iron deficiency results in anaemia. There is increasing need to determine iron ion concentration in medicinal, clinical, environmental and industrial samples. Solid contact PVC based membrane electrode provides an alternative platform by eliminating inner reference solution to achieve better response properties such as selectivity, sensitivity, response, pH range, and response time of ISE as well. The effects of different parameters such as the quantity of plasticizer, the type of plasticizer, pH of the sample solution, and coexisting ions on the potentiometric responses of the electrode were investigated. 2-Cyanomethyl N-Methyl-N-Phenyl Dithiocarbamate has strong affinity toward Fe (II) ions and thus it was assigned as an ionophore for designing a Fe^{2+} selective electrode with a slope of 31.55 mV per decade over a wide concentration range of $1.0 \times 10^{-7} - 1.0 \times 10^{-1}$ M Fe^{2+}. The obtained potential values remains constant between the pH ranges 4.5-7.5. The response time was found to be 25 seconds. The electrode revealed good selectivity for Fe^{2+} in the presence of different coexisting cations and anions. Detection of Fe (II) ions was successfully carried out in water samples with the proposed electrode.

Biography

Tugba Ozer has completed her MSc in Marmara University. She is a PhD student in Yildiz Technical University, Department of Bioengineering. Her areas of specialization are: electrochemistry, environmental chemistry, analytical chemistry, heavy metals, sensors, crop science, biopolymer, bioinformatics, systems biology.

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Chem Sci J 2016
ISSN: 2150-3494, CSJ an open access journal

Euro Chemistry 2016
June 16-18, 2016

Volume 7, Issue 2(Suppl)

Page 123