Fabrication of a New Modified Tm^{3+} - Carbon Paste Sensor Using Multi-Walled Carbon Nanotubes (MWCNTs) and Nanosilica Based on 4-Hydroxy Salophen

Nona Zaheiritousi¹, Hassan Ali Zamani^{1,*}, Mohammad Reza Abedi², Soraia Meghdadi³

¹ Department of Applied Chemistry, Mashhad Branch, Islamic Azad University, Mashhad, Iran

² Department of Applied Chemistry, Quchan Branch, Islamic Azad University, Quchan, Iran

³ Department of Chemistry, Isfahan University of Technology, Isfahan 84156-83111, Iran

*E-mail: mohamadrezaabedi@yahoo.com

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In this research, a new modified carbon paste electrode (CPE) including multi-walled carbon nanotube (MWCNT) and nanosilica (NS) and 4-Hydroxy Salophen (HS) as a suitable ionophore was constructed and applied as Tm^{3+} -ion selective sensor. This electrode shows a Nernstian response (19.2 ± 0.1 mV/decade) over concentration range of 1.0×10^{-8} to 1.0×10^{-3} mol L⁻¹. The electrode detection limit was found to be 9.0×10^{-9} mol L⁻¹ at a pH range of 3.1–7.8. The sensor has a response time of ~14 s. This electrode displays very good selectivity with respect to different interfering ions, including alkali, alkaline earth, transition and heavy metal ions. The created sensor was satisfactorily applied to determine Tm^{3+} ions in presence of metal ions mixture and used as an indicator electrode in the potentiometric titration of Tm^{3+} ions with EDTA.

Keywords: Sensor, Modified carbon paste electrodes, Ion selective electrode, Potentiometry

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