Construction of a New Modified Nano-Composite Tm^{3+} - Carbon Paste Electrode Based on N, N'-bis (pyridine-2-carboxamido)-2-aminobenzylamine

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A new modified nano-composite Tm^{3+} -carbon paste electrode (CPE) including nanosilica (NS) and multi-walled carbon nanotube (MWCNT) based on N, N'-bis (pyridine-2-carboxamido)-2-aminobenzylamine (BPCA) as an ion carrier was constructed. The electrode displays a Nernstian response (19.9 ± 0.3 mV/decade across a broad range (1.0×10^{-8} to 1.0×10^{-3} mol L⁻¹); a detection limits of 3.9×10^{-9} mol L⁻¹ between the pH range of 3.1–8.8 and a fast response time of ~5 s. The proposed Tm^{3+} -CPE showed a good Tm^{3+} selectivity over a wide variety of cations, including alkali, alkaline earth, transition and heavy metal ions. The created Tm^{3+} -CPE was satisfactory applied to the Tm^{3+} recovery from different metal ions mixture. It was also used as an indicator electrode in the potentiometric titration of Tm^{3+} ions with EDTA.

Keywords: Sensor, Carbon Paste Electrodes, Ion selective electrode, Potentiometry, Nano-Composite

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