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Determination of Selenium(IV) Using o-Phenylenediamine by Differential Pulse Polarography/Interference of Metal Ions

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Abstract: A new sensitive and selective pulse polarographic method for the determination of Se(IV) next to interfering ions is described. This method is based on the highly sensitive peak formed by the reaction of Se(IV) with o-phenylenediamine in Britton-Robinson buffer solution (pH 2.5) at -0.08 V vs. SCE. The new peak due to the Se(IV)/o-PDA complex not only prevents the interference of Pb(II), Cd(II) and Sn(II) for selenium, but also increases its sensitivity. A linear calibration graph is obtained for Se(IV) at a concentration of 5.0×10^{-8} to 6.8×10^{-5} M with a correlation coefficient of 0.9988. The proposed method showed good reproducibility and accuracy with a relative standard deviation of 5.5% and relative error of -5.6% for the determination of 5.0×10^{-8} M Se(IV) next to 5.0×10^{-7} M Pb(II). There is no serious interference from some ions when present at levels more than 50 times that selenium and no need for separation or pre-concentration procedures, which are tedious, time-consuming and polluting.

Key Words: Selenium determination, o-phenylenediamine, Interference's problem, Polarography

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