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Electrothermal Atomic Absorption Spectrometric Determination of Nickel after its Flotation Enrichment by Iron(III) Hexamethylenedithiocarbamate

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Abstract: Abstract. Nanogram quantities of nickel were removed from 1 L samples of dilute aqueous solutions by coflotation. A mixture of hydrated iron(III) oxide ($\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$) and iron(III) hexamethylene-dithiocarbamate ($\text{Fe}(\text{HMDTC})_3$) served as collectors. After flotation separation from the mother liquor, the solid sublimate containing nickel traces was dissolved and the analyte was determined by electrothermal atomic absorption spectrometry (ETAAS). All important parameters necessary for the successful collection of nickel were checked. The results of nickel ETAAS analysis in tap and spring waters were compared with inductively coupled plasma-atomic emission spectrometric measurements (ICP-AES). The limit detection of nickel by the ETAAS method is $0.0078 (\mu\text{g/L})$.

Key Words: Nickel, preconcentration, colloid precipitate flotation, iron(III) hexamethylenedithiocarbamate, collector, water, atomic absorption spectrometric determination

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