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Abstract: A sensitive, selective and rapid method for the determination of cobalt based on the rapid reaction of cobalt(II) with QADEAA and the solid phase extraction of the Co(II)-QADEAA chelate with C₁₈ membrane disks was developed. In the presence of pH = 5.5 buffer solution and cetyl trimethylammonium bromide (CTMAB) medium, QADEAA reacts with cobalt to form a violet complex with a molar ratio of 1:2 (cobalt to QADEAA). This chelate was enriched by the solid phase extraction with C₁₈ membrane disks. An enrichment factor of 50 was obtained by elution of the chelate from the disks with a minimal amount of isopentyl alcohol. In isopentyl alcohol medium, the molar absorptivity of the chelate is $1.43 \times 10^5 \text{ L mol}^{-1} \text{ cm}^{-1}$ at 625 nm. Beer's law is obeyed in the range of $0.01 \sim 0.6 \mu \text{g mL}^{-1}$ in the measured solution. The relative standard deviation for 11 replicate samples of $0.01 \mu \text{g mL}^{-1}$ level is 1.18%. The detection limit reaches $0.02 \mu \text{g L}^{-1}$ in the original samples. This method was applied to the determination of cobalt in environmental samples with good results.

Key Words: 2-(2-quinolylazo)-5-diethylaminoaniline, cobalt, spectrophotometry, solid phase extraction

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