SPECTROPHOTOMETRIC DETERMINATION OF NITRITE IN SOILS AFTER PRECONCENTRATION BY SODIUM DODECYLSULFATE MODIFIED NANO-PARTICLES OF MAGNETITE

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Abstract

Nitrite is present in bulk of soils. Nitrite is undesirable owing to its hazardous in environment and even human health. Carcinogenic effects of nitrite due to nitrosamines productions have been proved. Therefore nitrite must be controlled and monitored in environmental samples [1-3].

Reaction of diazotized sulfadimidine with 1-naphthylamine was used in a batch process for highly sensitive determination of nitrite in soil samples. In this enrichment-spectrophotometric procedure nano-particles of magnetite as adsorbent which were modified with sodium dodecylsulfate, was used as a solid phase extractant. Various affecting chemical parameters were evaluated and optimized. Preconcentration factor of about 200 with calibrations ranging from sub-ng ml-1 to about 50.0 ng ml-1 were obtained. Accuracy and precision of the method for a 4.0 ng ml-1 nitrite as recovery percent and relative standard deviation percentage were 99.5 and 0.8, respectively. Interferences studies of foreign ions were investigated which showed high selectivity of the method. Various soil samples were analyzed by the method after suitable sample handling. Standard addition method with additions of various amounts of nitrite was applied in nitrite determination. A standard (reference) determination procedure was also tested. The results of standard addition method also direct determination (no addition of standard) were compared with the standard tested method that showed excellent compatibility. The recovery percent and relative standard deviation percentage for all of the soil samples analyzed were in the ranges 97.3-102.6 and 0.3-1.5, respectively.

References:


Keywords: Nitrite, Sulfadimidine, Modified magnetite nano-particles, Spectrophotometry

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