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Quantification of Total Arsenic in Groundwater by HG-AAS Using Low Acid Concentration and L-Cysteine

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Abstract: A simple and inexpensive analytical method has been developed and applied for the quantification of total arsenic (arsenite + arsenate + monomethylarsonic acid + dimethylarsinic acid) in groundwater samples collected from various locations in United Arab Emirates. The method utilized HG-AAS and L-cysteine (as a pre-reducing agent) in low concentrations of nitric acid. The optimised experimental conditions were: 0.04 – 0.06 M HNO_3, 2% L-cysteine, and 15 minutes delay time after adding L-cysteine. The method's detection limit is 0.2 µg/L. The accuracy of the method has been checked using a CRM and spike recovery and found to be better than 83% with low standard deviations. The determined total arsenic concentration in the collected water samples was less than 5 µg/L. One advantage of this method over other comparable methods is that, it avoids the use of high acid concentrations. It is also suitable for routine batch analysis.

Keywords: *Arsenite, arsenate, monomethylarsonic acid, dimethylarsinic acid, ground water.*

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