

ASSESSMENT OF ARSENIC AVAILABILITY IN WELLS WATER FROM TIMIS-BEGA AREA BY USING DGT TECHNIQUE

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Abstract

The toxicity of arsenic (As) in the environment is influenced by its total concentration but also its availability. As mobilization from geological materials into ground and drinking water sources may represent an important jeopardy to human health and due to its high toxicity, As concentration in drinking water has low regulatory limit (10 µg L⁻¹). Determination of such low concentrations and the assessment of availability of As species is a challenging task. The objective of this study was to assess the arsenic concentration and its availability in underground water from wells used as drinking water sources. As available fractions was measured after passive sampling by using the Diffusive Gradients in Thin-films (DGT) technique, by deploying DGT devices in 1 L of the well-stirred sample. Twenty water samples from public and private wells from Timis-Bega area in Banat Plain, having a history of relatively high natural arsenic occurrence in Romania were collected. The total As concentrations in water samples were in the range of 0.2 – 106 µg L⁻¹, in majority of the samples total As level exceeding the guideline value (10 µg L⁻¹). As concentration measured by DGT technique showed a relatively high availability of As in analyzed water samples, generally over 70% of the total As concentration was found in labile forms.

Keywords: arsenic, underground water, Diffusive Gradients in Thin-films, availability, drinking water