

DETERMINATION OF SOME TOXIC ELEMENTS SUCH AS ARSENIC, SELENIUM, CHROMIUM AND LEAD USING ICP-MS AND GF-AAS IN RURAL GROUND WATER IN TERENGGANU, MALAYSIA

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ABSTRACT

The concentrations of some toxic elements Arsenic (As), Selenium (Se), Lead (Pb) and Chromium (Cr) etc in rural groundwater in Terengganu, Malaysia were determined using most sophisticated instrument ICP-MS and GF-AAS. Most of the populations of Terengganu live in rural area and they use ground water surviving their life. Obtained results are compared with WHO and interim water quality guideline. The determination of heavy and toxic elements in drinking water was obtained by elemental analysis techniques such as inductively coupled plasma mass spectrometry (ICP-MS) and graphite furnace atomic absorption spectrometry (GF-AAS). Groundwater samples were taken from different districts of Terengganu. Most importantly, ICP-MS has recently been described as a very sensitive, multi-element technique. Detection limits obtained by GF-AAS for heavy and trace metals such as Cr and Pb are 1.15 and 3.21 $\mu\text{g L}^{-1}$ respectively, and detection limits obtained by ICP-MS for As, Se and Pb are 8.3, 18 and 0.22 $\mu\text{g L}^{-1}$ respectively. Obtained results showed that all samples got high concentration of lead (Pb) but does not exceed the WHO and Malaysian standards.

Keywords: toxic elements, groundwater, detection limits, ICP-MS, GF-AAS