This article was downloaded by:

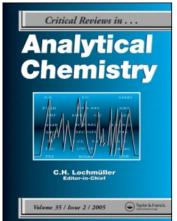
On: 17 January 2011

Access details: Access Details: Free Access

Publisher Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-

41 Mortimer Street, London W1T 3JH, UK



# Critical Reviews in Analytical Chemistry

Publication details, including instructions for authors and subscription information: http://www.informaworld.com/smpp/title~content=t713400837

### MICROELEMENTS IN GROUNDWATER

Kęstutis Kadūnas

Online publication date: 03 June 2010

To cite this Article Kadūnas, Kęstutis(1998) 'MICROELEMENTS IN GROUNDWATER', Critical Reviews in Analytical Chemistry, 28: 2, 143

To link to this Article: DOI: 10.1080/10408349891194478 URL: http://dx.doi.org/10.1080/10408349891194478

#### PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: http://www.informaworld.com/terms-and-conditions-of-access.pdf

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

### MICROELEMENTS IN GROUNDWATER

## KĘSTUTIS KADŪNAS

Geological Survey of Lithuania, Vilnius

Groundwater monitoring has been performed in Lithuania for the last 50 years. Hydrochemical monitoring of groundwater was initiated 20-25 years ago. Water was investigated only in respect of ground water level registration and general chemical composition while investigation of microelement content was not paid adequate attention. However, concerning confined aquifers, statistical analysis of distribution of microelements was carried out. It has been serving as the basis while measuring the background values of microelement content in groundwater. Shallow goundwater was investigated only in respect of general chemical composition with rather random tests for microelements. There were only a few attempts made to measure the background values of microelements as well as to determine their origin.

In recent years, hydrogeological mapping, groundwater monitoring and additional specialized environmental hydrogeology tasks accounted for a considerable share of the projects undertaken by the Geological Survey of Lithuania. Also more data on microelement concentration in shallow groundwater was collected. In 1993-1996, more than 400 samples of water were collected at geological mapping and other test sites and investigated in respect of microelement composition. For the purpose of the study, the term "microelement composition" means determination of the content of each following chemical element in the water: zinc, manganese, copper, lead, chromium, cobalt, cadmium, nickel, iron, flour, strontium and aluminum. Out of these, lead, cadmium, nickel and chrome are understood to be trace metals. Maximum Admissible Concentration of each of the above elements in potable water is very restrictive.

Groundwater has been used by over 1 million people and will be consumed long into the future. This makes the information on microelement content in shallow groundwater to be very important.

Table. Results of statistical evaluation of microelements in groundwater(mg/l)

Value	Zn	Mn	Cu	Pb	Cr	Co	Cd	Ni	Fe	F	Sr	Al
Average	0.502	0.454	0.033	0.015	0.039	0.009	0.023	0.042	1.225	0.123	0.148	0.054
Std. error	0.083	0.043	0.004	0.001	0.010	0.001	0.019	0.016	0.401	0.020	0.011	0.029
Mean	0.071	0.154	0.006	0.009	0.006	0.007	0.000	0.010	0.142	0.073	0.127	0.017
Modal	0.040	0	0.003	0	0	0	0	0	0.100	0	0.090	0.008
Std.	1.61	0.83	0.09	0.02	0.19	0.02	0.37	0.31	4.88	0.17	0.08	0.21
deviation												
Dispersija	2.58	0.69	0.01	0.00	0.03	0.00	0.13	0.10	23.80	0.030	0.01	0.04
Minimum	0	0	0	0	0	0	0	0	0	0	0.036	0.001
Maximum	19	6.4	0.9	0.125	2.6	0.185	7	6	38.39 5	0.795	0.366	1.5
Total	187.7	169.4	12.20	5.71	14.62	2.78	8.44	15.56	181.2 4	8.71	7.71	2.83
No. of samples	374	373	375	375	373	309	366	370	148	71	52	52

The data provided in the Table represent concentrations of evaluated microelements in shallow ground water without standpoint in what lithological conditions it occur.