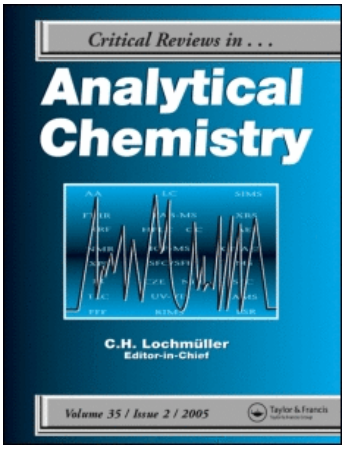

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NITROGEN COMPOUNDS IN DRINKING WATER: ACCUMULATION,TRANSPORT AND TRANSFORMATION

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Through history the quality of drinking water has been a factor in determining human welfare. There is increasing worldwide concern over the negative effects of economic development on water quality. Agriculture among other activities has an impact on the surface and groundwater quality, it is both a major water user and a major sources of pollution. Sedimentation, fertilizers and pesticides have been indicated as the main agricultural polluting sources and drinking water is the single most polluted water use.

In Lithuania over a one million people depend on supply of drinking water from shallow wells that mostly take groundwater. A high number of shallow wells are contaminated with pollutants, which levels are above the accepted standart and water is hazardous for human health.The concern has been raised concerning nitrate contamination of grounwater both in Lithuania and other countries .It is furthermore towards these aspects that EU has oriented its resent directive on "Protection of water against pollution by nitrates from agricultural sources (91/676 EEC).

Our studies of drinking water quality in shallow wells were initiated in 1989. Investigations in Kaunas region wells showed that most groundwater is being polluted by nitrogen compounds and organic materials. The attention of experiments was foccused on nitrogen compounds problems. Monitoring studies of the shallow wells show that the nitrogen compound levels have not changed very significantly even though nitrogen fertilizers use decreased markedly. The quality of drinking water will remain as highest concern in rural areas

Contents of water quality factors were exposed to homestead ecovariables, agricultural practices and hydrogical conditions. The effects of ecovariables, such as depth of well, time-period from last cleaning,breeding of domestic animals, distance from barn and garden to well, were different on clay versus sandy soils. The evaluation of environmental factors shows that the pollution of wells highly depends from pollution source and the flow direction of grounwater from the source of contamination to well.

Studies of water pollution were extended to evaluation of chemical and biochemical processes in water involving nitrogen compounds transport,transpormation, interactions among different phases. A knowledge of aquatic environmental chemistry is essential for better understanding of sources, interactions and effects of water pollutants, for better control and prevention of pollution. The field and laboratory measures of NO_3, NO_2 and NH_4 transport with water and transformation of nitrogen compounds in different types of soils were carried out. Statistical and regresion analyses were used for evaluation of results.The mathematical reliationships between nitrogen dynamics in soil and nitrate leaching were obtained.

Investigations let us study the mechanism of pollutants transport with grounwater. Data will be use for future reliable nitrogen model applications.