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RESEARCH ON IDENTIFYING CONTAMINATION OF DRINKING WATER SOURCES CONTAMINATED WITH CHEMICAL

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Abstract

Drinking water and drinking water sources is an international problem. Behind this problem is the man, both in terms of consumption and in terms of using unreasonable. Contamination of drinking water is an important public health concern worldwide. The hazards of microbial contamination and chemical contamination hazards can cause health problems, both in developed and developing countries. Identification and prioritization of chemical risks is a challenge, especially in developing countries, and not only.

Key words: public health, chemical hazards, chemical contaminants, risks of contamination

INTRODUCTION

Contamination of drinking water is an important public health concern worldwide. The hazards of microbial contamination and chemical contamination hazards can cause health problems, both in developed and developing countries.

Drinking water and drinking water sources is an international problem. Behind this problem is the man, both in terms of consumption and in terms of using unreasonable. Pollution microbial and chemical pollution can be produced naturally or by man, that is coming from sources of pollution. Chemicals present in drinking water can cause serious health problems.

Microbial pollution and chemical pollution can be produced naturally or by man, that is coming from sources of pollution. Chemicals present in drinking water can cause serious health problems. On a global scale, fluorine and arsenic are the most important chemicals, with serious repercussions on the body, affecting millions of people.

Local sources of contamination of drinking water may be:

a) - Natural sources when chemicals are present in water specific type of soil in that area, such as for example pollution with some algae or cyan bacteria, in the case of water surface;

b) - Chemicals from agricultural activities and not only (if the source of drinking water is close to farm animals, when not fulfilled the requirements of their location), may occur with nitrate pollution, pesticides and other chemicals representative;

c) - sources of groundwater pollution from local channel;

d) - sources of groundwater pollution from leaking fuel from both cars and if the near source water filling stations exist when the demands are not met by placing their;

e) - sources of groundwater pollution from chemicals from industrial activities such as processing and mining;

f) - Chemicals from water and its distribution, water treatment chemicals, corrosion, and leakage from, storage tanks and pipelines.

The vast majority of chemicals that can pollute ground water are closely related to these categories of pollution sources. However, many other chemicals may be important contaminants of drinking water in accordance with specific local conditions.

In many cases, identifying and assessing health risks from excessive water-based on analysis of water samples. Limitations of this approach are well known, and contributed to the delay in recognition of arsenic in drinking water, is a significant health concern in most countries.

World Health Organization has developed "Guidelines for water quality, strictly in terms of drinking water, incorporating 'water safety plans."

Effective prevention management of chemicals in drinking-water needs simple tools to distinguish the goods The purpose of this research is the chemical to identify certain chemicals present in water sources (springs wells) from several localities, but also the quantity of these substances if they are exceeded legal requirements and standards for our country.

This of chemicals in drinking water from groundwater beyond the limit allowed, presents major health risks to consumers, often causing death.

MATERIAL AND METHODS

Sampling of water is a very important step in the process of physical-chemical analysis of water samples must be as representative and should not introduce changes in the composition and quality of water due to faulty techniques or improper preparation conditions material.

Harvesting water for physico-chemical analysis is done in glass or polyethylene bottles fitted with glass stopper or sealed. Collection vessels should be washed well to remove any organic matter or other impurities that could distort the composition of the sample. Money is made by mixing sulfocromic and detergent, then rinse thoroughly with tap water, distilled water and distilled twice and finally dispersed.

In time of harvesting container will be rinsed with water that is 2-3 times to be harvested, then fill with water for analysis to the brim, and the stopper will be fixed so that no air bubbles remain inside the container.

The first stage is sampling water distance from existing wells both in local households and directly laivorul water, sources present in the range of localities, especially in forest areas. The mention of these sources is that man rarely drink water, especially tourists coming into the area.

Also water samples taken from wells of the local people in ministry will be named: FL 1, FL2 and FL3, and water samples taken from the sources will be called I1si I2. Water samples taken are in number 10 (ten) from each source and representing the number of studies and research undertaken.

Research undertaken by us are aimed at determining the following categories of possible chemical contaminants of drinking water:

1. Determination of fixed residue;
2. Determination of hydrogen ions (pH);
3. Determination of anion: (Cl^-), (SO_4^{-2}), (NO_2^-), (NO_3^-);
4. Determination of cations: (NH_4^+), (Fe^{+2}, Fe^{+3});
5. Determination of organic substances (oxidabilitate or KMnO4 consumption);
6. Determination of ions: Mn^{+2}, Cu^{+2}, Zn^{+2}, Ag^+, Cd^{+3}, Cr^{+3}, Hg^{+2}, $Ni^{+2,+3}$, Pb^{+2}, Se^{+2}.

1. Determination of fixed residue

Fixed residue is all organic and inorganic substances dissolved in water, not volatile at T = 105°C. For each sample of water taken, we used 100 ml of water for analysis, which we introduced in glass capsules bran, introduced then heat in oven regulated at 105^0C for 15 min. After cooling I weighed capsule. We used the method of calculation formula:

Calculation: If the V_{ml} ....G_1-$G_{2\ mg}$ residue

1000_{ml}........................ $_{mg}$ residue $=[(G_1-G_2)/V] \cdot 1000$,

where: G1 - capsule mass at 105°C dry residue (mg), G2 - weight capsule (mg), V - volume of water got in it.

2. Determination of hydrogen ions (pH);

pH of water varies slightly towards neutrality because this CO2, HCO3-, CO3-2 and some salt with acid hydrolysis, basic question. Determining the exact pH we performed electrochemical method with a glass electrode.

The principle method: difference potential existing between a glass electrode and a reference electrode (calomel - saturated KCl solution) introduced into the water sample analyzed, the difference of potential varies linearly with the pH test. This method is precise and can be applied including cloudy or colored water. Expression of results is by calculating the average of 3 to 5 determinations.

3. Determination of anion: (Cl^-), (SO_4^{-2}), (NO_2^-), (NO_3^-);

a) Determination of chloride ion (Cl-) in water can come from soil chlorides, when present in constant concentration or contamination by municipal and industrial wastewater and is an indicator variable concentrations of pollution. Determination of Cl-is titrimetrice methods. According to Mohr method water samples were titrated with AgNO3 solution in neutral medium in the presence of potassium color as the reactions:

$Cl^- + Ag^+ \longrightarrow AgCl$ (white precipitate)

$CrO^{-2}_4 + 2\ Ag^+ \longrightarrow Ag_2CrO_4$ (reddish brown precipitate)

This method can be applied to samples which contain high concentrations of phosphate.

Procedure: 100 ml water for analysis were neutralized with H2SO4 or NaOH ground as indicated in this pH indicator neutral red. Were taken to separate work and neutralized 100 ml water sample was added 1 ml potassium chromate solution and titration was performed with silver nitrate to ground the appearance of a precipitate red - brick.

The method is nonspecific as halogens and others present in the water reacts with silver nitrate, but they are in very low concentrations (Br-, I-) their interference is negligible. Sulphites present in the water interfere and be transformed into sulfates by treating the sample with 1 ml 100 ml perhydrol.

Calculation: given that 1 ml solution $AgNO_3$ 0,1 N titrate 3,545 mg Cl^-

b) Determination of sulphates (SO_4^{-2})

Determination of sulphites and sulphates is global by passing sulphites sulfate by treating samples of water (100 ml) with perhydrol (1 ml).

Their determination was done gravimetrically by precipitation of sulphates as barium sulphate insoluble in acid medium.

Procedure: Samples of water 250 ml water for analysis were treated with 1 N HCl solution in the presence of methyl orange to indicate environmental acid (red color), adding 2 ml HCl excess. Then samples were heated to boiling, adding 5% BaCl2 solution hot drop to total sulphate precipitation.

After submitting the precipitate (about 3 o'clock in the bath water) to check if the precipitation is complete, by adding 2-3 drops of BaCl2 (a portion of clear solution obtained after decanting). After 12 o'clock the mixture was filtered through a quantitative filter (blue band) and the precipitate was washed with hot distilled water to remove chloride ions. Filter the precipitate was made into a tared crucible (exact mass) and was calcined at

200 ° C for 3 o'clock. After cooling were added a few drops of nitric acid to convert to sulfate, sulfur reduction of a part of sulfate by carbon in the filter paper. Nitric acid was removed (by evaporation) heating furnace. Then the crucible with the precipitate was again calcined.

Calculation: Mg SO_4^{-2}/l =m · 0,4105 ·1000 / V, where Is 0.4105 mg corresponding to 1 mg sulfate BaSO4, m = mass of the precipitate calcined in mg, V = volume of water taken for analysis, ml.

c) Determination of nitrites (NO_2^-)

Nitrites in the water may come from contamination by organic substances containing nitrogen, found decomposing in the process of self-purification. Determination of nitrites in water was done by colorimetric method with Griess reagent.

Method Principle: nitrites in the sample diazotizes sulphanilic acid in acid medium. Diazoniu resulting salt is coupling with α-naphthyl-amine, forming a red colored azoic compound with λ max = 520nm. Reagents:

- Griess Reagent I: 1.6 g sulphanilic acid soil dissolve in 100 ml CH3COOH 30 % (solution is stable) -

- Griess reagent II 1 g α-naphthyl-amine is dissolved in 50 ml hot distilled water, filter and make a 200 ml volumetric flask (at sign) with 30% acetic acid solution - nitrite standard solution: 0.15 g NANO2 bring to 100 ml distilled water, 1ml of this solution is diluted to 100 ml (1 ml of this solution contains 0.010 mg NO2-). The solution is not stable - using only freshly prepared. By mixing the corresponding reagents in a series of tubes we have achieved 6 standard scale, presented in *Table 1*:

Table 1

Standard scale for determining nitrites in water with Griess reagent

Reactive	**Sample Number**						
Etalon NO_2	0	1	2	3	4	5	6
(1 ml 0,010 mg NO2)	0	0,1	0,2	0,3	0,4	0,6	1
Ml distilled water	10	9,9	9,8	9,7	9,6	9,5	9
Reactive Gries I (ml)	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Reactive Griess II (ml)	0,5	0,5	0,5	0,5	0,5	0,5	0,5

Procedure: After preparation solutions for the scale $NaNO_2$ standard after 20 minutes to read an absorbing spectrophotometer to λ = 520nm, 1 cm shaft, compared to controls. Analyzed water sample was filtered prior to this analysis (not to introduce errors). Samples of 10 ml were treated with 0.5 ml Griess reagent I and 0.5 ml Griess reagent II (reactions were performed in the measuring cylinder and Griess reagents were special pipette with pipette). After a rest of 20 min absorbency was read at the spectrophotometer in the same conditions as the standard scale. Calculation: I found using the standard curve concentration NO2 - adequate proof.

d) Determination of nitrate (NO_3^-)

In water, nitrates can come either from mineralization of organic substances (the last stage of their oxidation) or in soil where found in constant concentration. Determination of nitrates was made by a colorimetric method *(Table 2).* Principle of the method: The sample for analysis was treated with phenol disulphonic acid reacting with nitrates present in the sample. After reaction to form nitro-phenol-disulphonic acid, tinted yellow with λmax = 410nm.

Reagents:

- Fenoldisulphonic acid (12g crystallized phenol were dissolved in 144g H2SO4 (ρ = 1.84 g / cm3) (sulfuric acid used was first heated to boiling to remove any traces of nitric acid present) - hydroxide solution 25% ammonium - nitrate standard (0.1631 g KNO3 oven dried to constant weight were passed quantitatively into 100 ml volumetric flask and add distilled water to volume. 1ml of this solution was diluted to 100 ml (1ml of the diluted solution contains 0.01 mg NO3-).

Table 2

Determination of nitrates by colorimetric method

	Sample Number						
	0	1	2	3	4	5	6
ml standard NO_3 (1ml = 0,01 mg)	0	0,5	1	2	3	4	5
mg NO_3-	10	5	10	20	30	40	50
ml distilled water	1	9,5	9	8	7	6	5
ml reactive	1	1	1	1	1	1	1
ml NH_4OH	10	10	10	10	10	10	10

Procedure:

5 -10 ml volumes of sample to be analyzed were placed in porcelain capsule and were evaporated to dryness. After cooling, the above residues were added 1 ml acid fenoldisulphonic. After 15 minutes, during which the reaction took place, were added to 9 ml of distilled water, 10 ml concentrated ammonia.

After adapters in test tubes was determined optical absorption, compared to control at λ = 410 nm. Calculation: Using the calibration curve E = f (c) to determine the content of NO3 in the samples.

4. Determination of cations

a) Determination of ammonia (NH_4^+)

Ammonia can be reached from ground water (groundwater concentration to be constant in time) or the mineralization of organic substances in the water self-purification process. In a surface water ammonium indicate this pollution by organic substances. Ammonium determination was performed by titration. To assess the correct amount of ammonia, water samples were distillate after they were brought to pH 7.4 by treatment with a phosphate buffer. The water vapor distillation train ammonia vapor. Ammonia was distilled directly barbotat a H2SO4 solution (concentration 0.1 N) in the presence of methyl red indicator (0.1% solution). Excess an H2SO4 was titrated with NaOH solution (0.1 N).

Reagents:

- H_2SO_4, solution 0,1 N;
- NaOH, solution 0,1 N;
- Phosphate buffer, pH 7.4 (in a 1000ml volumetric flask was dissolved 14.3 g KH2PO4 and 68.8 g K2HPO4, entering the water to volume)
- 0.1% methyl red soil.

Procedure:

In the distillation plant Wurtz flask were introduced 500 ml water for analysis, were added to 10 ml phosphate buffer and pH measured by electrochemical method, then start the distillation. Distillate (NH3 (v) + H2O (v)) was collected by bubbling in 0.1 N H2SO4 solution and few drops of indicator to yellow color (indicating the acidic environment). Distillation was performed until about 2 / 3 of initial volume of the sample. Excess H2SO4 titrate with 0.1 N NaOH solution until a persistent pink color appearance.

Calculation:

$$\text{mg } NH_4 / l = [(V_1 - V_2 \cdot f) / V] \cdot 1{,}8 \cdot 1000$$

V = ml samples taken in this,

V1 = ml of 0.1 N H2SO4 solution was collected in the distillate,

V2 = ml of 0.1 N NaOH used for titration of the excess H2SO4,

f = factor of 01.1 N NaOH solution,

1, 8 - 0.1 N H2SO4 solution titre expressed as mg NH4 +.

b) Determination of iron ions (Fe^{+2}, Fe^{+3})

Iron is found in water as ferrous or iron compounds in the form of bicarbonate, carbonates, sulfates, phosphates and silicates, soluble or insoluble.

Determination of iron ions (Fe^{+2}, Fe^{+3}) was also made by atomic absorption after the samples were prepared as follows: 90 ml samples of each water examined were treated with 10 ml of solution 1 N HCl and boiled the bath water to convert the iron present in water soluble compounds (chlorides) and maintaining iron in reduced state (Fe +2). After cooling the sample was added to 100 ml distilled water and readings were performed on the device.

5. Determination of organic substances (oxidabilitate or KMnO4 consumption)

Oxidable substances from water or chemical oxygen demand (COD) are compounds that can be oxidized by KMnO4 or K2Cr2O7 cold or hot. Inorganic substances (Fe+2, Mn +2, sulfites, nitrites) are oxidized to cold, and the organic, warm.

The principle method for determining organic substances consists in their oxidation with KMnO4 in acid medium in the case of the chloride content in May than 300 mg / l and alkaline content in the case of more than 300 mg / l as chloride ions in acid medium character and reducing their presence in amounts exceeding 300 mg / l cause appreciable errors.

In acid medium:

$$MnO_4^- + 8H^+ + 5e^- \longrightarrow Mn^{+2} + 4H_2O$$

Excess permanganate reacts with oxalic acid

$$2KMnO_4 + 5H_2 C_2 O_4 + 3H_2 SO_4 \longrightarrow K_2SO_4 + 2Mn SO_4 + 10 CO_2 + 8 H_2O$$

In alkaline:

$$MnO_4^- + 2H_2O + 3e^- \longrightarrow MnO_2 + 4OH^-$$

The excess of permanganate and oxalic acid react with MnO2 result in acid medium:

$$MnO_2 + H_2 C_2 O_4 + H_2SO_4 \longrightarrow MnSO_4 + 2CO_2 + 2H_2O$$

Reagents - 0.01 N oxalic acid solution (0.6304 g oxalic acid to bring in 100 ml volumetric flask, add distilled water to volume); - potassium permanganate solution 0.01 N (0.3160 g KMnO4 bring in volumetric flask add distilled water to volume, the factor solution to determine before each determination) - Sulfuric acid, 30% solution (KMnO4 solution treated with cold, until the appearance of persistent pink and white color) - sodium hydroxide 30% solution.

Procedure: Given the chloride content below 300 mg / l am resulted oxidability in acid medium. Thus from water samples from sources 1 and 2 (each 100 ml of each) were added to each 5 ml 30% H2SO4 solution, 10 ml 0.01 N KMnO4 and were boiled for 10 min (the sieve) after more than hot solution were added 100 ml of oxalic acid 0.01 N. After the solution was completely bleached excess oxalic acid titrated with KMnO4 until the emergence of low-pink color persisting. mg KMnO4 = [(V + V1). f -V2] .3.16 For greater accuracy due to this mineral substances reducing (eg NO2-, SO32-, etc..) titration was performed one additional for each sample (different sources) at room temperature. V0-ml KMnO4 used soil for titration of cold - mg KMnO4 = Vo. f. 3.16 (mg KMnO4 oxidation of minerals used for character reduction). This amount is subtracted from the mass of KMnO4 used to get hot mg KMnO4 oxidation of organic substances needed. Mg KMnO4 = [(V + V1-Vo) f - V2]. 3.16.

Organic pollutants are: hydrocarbons, halogenated derivatives, amines, nitro, phenols, detergents, pesticides, etc..

Taking into account the diversity of these compounds (large number, composition and different structure), and the fact that they are found as micro (their concentration in water is very small, but their presence is responsible for the disappearance of an entire species and food chain contamination) . representative analysis were supported by colleagues from the laboratory DSV - Oradea.

6. Determination of ions Mn^{+2}, Cu^{+2}, Zn^{+2}, Ag^{+}, Cd^{+3}, Cr^{+3}, Hg^{+2}, $Ni^{+2,+3}$, Pb^{+2}, Se^{+2}
These ions are found in waters of great depth and come in very small quantities of soil through dissolution of salt. Being in very small quantities, their presence can be determined only by special methods for atomic absorption. These ions are considered toxic substances. In surface water pollution from municipal, industrial. Their presence in drinking water is admitted only exceptionally and in very small quantities under stasurilor quality.

RESULTS AND DISCUSSION

In normal chemical composition of water in a large number of substances which are classified into:

- gases (O2, CO2, H2S)
- mineral substances (macro, micro, biogenic substances: ammonia, nitrites, nitrates, phosphates)
- organic substances (hydrocarbons, phenols, halogenated derivatives, amines, pesticides).

In the processing of drinking water in the end is placed in water in specific quantities, substances which ensure its drinkability conditions (residual chlorine ions, aluminum silicates, fluorides). Along with existing compounds normally or deliberately added to water, it may contain, in varying concentrations of substances present in accidentally-pollutants. Chemical analysis of water includes the determination of all these components in water. In an important first chemical analysis of water pollution indicators are determinations: organic substances, ammonia (ammonium), nitrites, nitrates, chlorides, phosphates.

Public health is determined by other factors and an adequate supply of drinking water to rural population through individual facilities or public fountain type. Chemical Contamination of drinking water generally determines the type of chronic health effects. Acute Methemoglobinmia is a case of acute damage to the population due to contamination of water from wells with nitrates, especially for the age group 0 to 1 year. The results obtained from research we have recorded in these tables.

Table 3

The results recorded after ion determinations for key features

Indicator / Symbol	**Permissible concentration (mg / l)**	**Source of evidence**					**Method**
		FL1 (mg/l)	**FL2 (mg/l)**	**FL3 (mg/l)**	**I1 (mg/l)**	**I2 (mg/l)**	
Chlorides / Cl^-	250	44,8	40,5	42,5	-	-	Chemical tests
Sulphates / SO_4^{-2}	200	60,9	58	59,50	-	-	Chemical tests
Hydrogen-carbon / HCO_3	-	682	350	480	450	690	Chemical tests
Sodium / Na^+	100	46,7	50	48	70	12	Atomic absorption
Potassium / K^+	10	3,2	2,5	3,00	5,5	6,7	Atomic absorption
Calcium / Ca^{+2}	100	66,12	65	52	88	15,51	Atomic absorption
Magnesium / Mg^{+2}	50	130.2	43	75	25	42,5	Atomic absorption
Fixed residue (105 ° C)	Min 100 Max 800	103	120	160	136	180	Gravimetric

(*) Considering the fixed residue is the sum of the masses above mentioned ions HCO3 mass was calculated by difference.

Table 4

The results recorded after pH determination

Indicator / Symbol	U.M.	The amount allowed	Source of evidence					Method
			FL1	FL2	FL3	I1	I2	
Conc. hydrogen ion / pH	Unit. pH	6,5 – 7,4	6,6	6,9	7,0	6,4	6,5	Electrochemical

Table 5

The results recorded after test of undesirable substances

Indicator / Symbol	**Permissible concentration (mg / l)**	**Source of evidence**					**Method**
		FL1 (mg/l)	**FL2 (mg/l)**	**FL3 (mg/l)**	**I1 (mg/l)**	**I2 (mg/l)**	
Nitrates/ NO_3^-	50	24,61	14,6	12,5	38	24	Spectro photometry
Nitrites/ NO_2^-	0,5	0	0	0	0	0	Spectro photometry
Ammonia/ NH_4^+	0,5	0,5	0,1	0,1	0,2	0	Titrimetric
Oxidabilitate/ $KmnO_4$	3	0,85	1,2	0,5	0,4	0,5	In acid medium
Total iron/ $Fe^{2+;3+}$	0,3 µg/ l	SLD	0,22	SLD	0,21	0,1	Atomic absorption
Manganese / Mn^{2+}	50 µg/ l	0	0	0	0	0	Atomic absorption
Copper / Cu^{2+}	0,1 µg/ l	0,07	0,5	0,1	0,03	0,02	Atomic absorption
Zinc / Zn^{2+}	7 µg/ l	0,5	0,2	0,3	3,4	2,8	Atomic absorption
Phosphates / PO_4^{3-}	5	SLD	0	0	0,28	0	Spectro photometry

Table 6

The results recorded after test of toxic substances

Indicator / Symbol	**Permissible concentration (µg / l)**	**Source of evidence**					**Method**
		FL1 (mg/l)	**FL2 (mg/l)**	**FL3 (mg/l)**	**I1 (mg/l)**	**I2 (mg/l**	
Arsenic / As	50	-	-	-	-	-	Thermal absorption
Cadmium / Cd	5	-	-	-	-	-	Thermal absorption
Cyanide / CN^-	10	-	-	-	-	-	Spectro photometry
chromium / Cr	50	-	-	-	-	-	Atomic absorption
Mercury / Hg	10	-	-	-	-	-	Atomic absorption
Nickel / Ni	100	-	-	-	-	-	Atomic absorption
Lead/ Pb	50	20,50	-	-	-	-	Atomic absorption
Selenium / Se	10	-	-	-	-	-	Atomic absorption
hydrogen sulfide / H_2S	0	-	0,02	0,05	-	-	Titrimetric
Phenol (indices de phenol)/ C_6H_5-OH	0	-	-	-	-	-	Spectro photometry
Surfactants (in lauryl sulfate)	0,2	-	-	-	-	-	Spectro photometry

Table 7

The results recorded after test of toxic substances - chloride pesticides + PCB (max 0.10 mg / l for each component and their sum does not exceed 0.5 µg /ml

Symbol	**Concentration dmits (µg/l)**	**Source of evidence**					**Method**
		FL1 (mg/l)	**FL2 (mg/l)**	**FL3 (mg/l)**	**I1 (mg/l)**	**I2 (mg/l**	
Alpha – HCH	-	0,03	0,06	0,02	-	-	Gas chromatography
Gamma – HCH	-	0,00	0,02	0,00	-	-	Gas chromatography
Heptaclor	-	0,02	0,04	0,00	-	-	Gas chromatography
Aldrin	-	0,00	0,00	0,00	-	-	Gas chromatography
Beta – HCH	-	0,00	0,00	0,00	-	-	Gas chromatography
Delta – HCH	-	0,00	0,00	0,00	-	-	Gas chromatography
Heptaclor Epoxid	-	0,00	0,00	0,00	-	-	Gas chromatography
Endosulfat I	-	0,00	0,00	0,00	-	-	Gas chromatography
4,4' – DDE	-	0,00	0,00	0,02	-	-	Gas chromatography
Dieldrin	-	0,00	0,00	0,00	-	-	Gas chromatography
Endrin	-	0,00	0,02	0,00	-	-	Gas chromatography
Endosulfat II	-	0,00	0,01	0,00	-	-	Gas chromatography
4,4' – DDD	-	0,00	0,00	0,00	-	-	Gas chromatography
4,4' – DDT	-	0,00	0,02	0,00	-	-	Gas chromatography
Endrin Aldehida	-	0,00	0,00	0,00	-	-	Gas chromatography
Endosulfan Sulfat	-	0,00	0,01	0,00	-	-	Gas chromatography
Total pesticides	-	0,1	0,26	0,02	0	0	Gas chromatography

The vast majority of chemicals that may be of concern in drinking water are associated with these categories of sources, but other sources are not considered in this publication may sometimes be important.

CONCLUSIONS

The data presented in tables show some differences in chemical composition of water samples from two sources. As expected fixed residue mass determined at 105 ° C is higher if mineral water than in the case of water from Reta. Note that if fixed residue water table is close to the maximum limit, hence we concluded that drinking water in Iasi is a rough water. Another noted the data is the chloride ion concentration, sulfate, nitrite, nitrate, ammonium , organic substances greater for water than in the case of mineral water as drinking water is clearly the network (originating in a certain part of surface water) compared to mineral water (from underground water sources) is more polluted.

However it is important to note that water quality is provided under STAS sites in force. All the data presented in the table shows that in the case of mineral water concentration of magnesium ions exceeds the maximum. It should be noted that the quality standards for drinking water are not for the mineral. Also in STAS mineral water sites allowed a higher concentration of Mg 2 ions if the concentration of SO4-2 is less than 100 mg / l. The data presented show that mineral water is mineral water analyzed hidrogeno-Carbonato-magnesian. Knowing that the compositions and II correspond to a lower concentration of Ca 2 ions, the literature recommends that a mineral water with special qualities (energy accumulation favors sub cellular layers of muscle tissue, the body gives increased energy during exercise prolonged stress and prevents the emergence and attenuates atherosclerosis, lead to lower the concentrations of cholesterol, etc.).

But do not forget that though in tiny amounts and well below the accepted and mineral water contains pollutants. The final conclusion being that it is pulling a signal necessary alarm on environmental pollution (especially water) and starting a comprehensive educational program on the support level of water quality.

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REFERENCES

1. National Authority for Sanitary Veterinary and Food Safety ,1992, Cooperation agreement in November 20, between the Office for Consumer Protection and general veterinary - PGC 01.08.00.92 - Published in the Official Gazette, Part I no. 39 of February 23, 1993;
2. Collection STAS 2002"protection of water quality",
3. CM Gheorghita, M. Grigoras, J. Tivlea, 2000, "The world we want" Published Spiru Haret, Iasi, p.;
4. D. Calugaru, I. Savinescu, N. Nedea, 2000,"A first step in environmental education" Ed Spandau, Iasi, pp;
5. R. Ciucureanu, M. Voitcu "Sanitary Chemistry" practical, 1996, Univ. "Gr T. Popa ", Fac. Of Pharmacy, Iasi,;
6. S. Manescu, M. Cucu, ML Diaconescu "Sanitary Environmental Chemistry, Medical Publishing House, Bucharest, 1994.