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STUDYING THE ACTION OF DIFFERENT FACTORS ON TH ELECTRICAL CONDUCTIVITY OF WATER

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ИССЛЕДОВАНИЕ ДЕЙСТВИЯ РАЗЛИЧНЫХ ФАКТОРОВ НА ЭЛЕКТРОПРОВОДНОСТЬ ВОДЫ

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СУДЫҢ ЭЛЕКТР СИППАТАМАСЫ ЖӘНЕ ӘЗІРЛЕСТІК ФАКТОРЛАРДЫҢ ӘДІСІМІЗ

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Abstract

Water is the most common substance of «our» world, but its properties have not yet been fully studied. In the laboratory of nanostructuring of liquid media at the North Kazakhstan State University named after M. Kozybayev an experiment is being conducted to determine the electrical conductivity of different water samples. This paper presents the results of studies of the electrical conductivity of two types of water: flowing and boiled. The experiment was repeated with a decrease in the cooling time of the thermally treated water in order to exclude the effect of microorganisms on the composition of the water. During the experiment, it was found that the electrical conductivity of boiled water is higher than the electrical conductivity of running water. The measurement results can serve as proof of the existence of a theory about the occurrence of non – polar monocluster structures in the volume of water under the influence of external overpressure.

Key words: electrical conductivity, running water, boiled water, property of water, electrical conductivity of water.

Аннотация

Вода наиболее распространённое вещество «нашего» мира, однако её свойства до конца до сих пор не изучены. В лаборатории наноструктурирования жидких сред при Северо-Казахстанском государственном университете им. М. Козыбаева проводится эксперимент по определению электропроводности разных образцов воды. В данной работе представлены результаты исследований электропроводности двух видов воды: проточной и кипяченной. Эксперимент был повторён с уменьшением времени остывания термически обработанной воды, что бы исключить воздействие микроорганизмов на состав воды. В ходе эксперимента было обнаружено, что электропроводность кипяченной воды выше электропроводности проточной воды. Результаты измерений могут послужить доказательством существования теории о возникновении не полярных монокластерных структур в объеме воды под воздействием внешнего избыточного давления.

Ключевые слова: электропроводность, проточная вода, кипяченная вода, свойство воды, электропроводность воды.

Аңдатпа

Су – «біздің» әлемдегі ең таралған зат, бірақ оның мүлкі әлі толық зерттелмеген. М. Қозыбаев атындағы Солтүстік Қазақстан мемлекеттік университетінде сұйық ортаны нанокұрылымдау зертханасында әртүрлі су үлгілерінің электрөткізгіштігін анықтау бойынша тәжірибе жүргізілуде. Бұл мақалада судың екі түрінің электр өткізгіштігінің зерттеу нәтижелері келтірілген: ағынды және пісірілген. Эксперимент микроорганизмдердің судың құрамына әсерін болдырмау үшін термикалық өңделген судың салқындату уақытын төмендетумен қайталанды. Эксперимент барысында қайнаған

судың электр өткізгіштігі ағын судың электр өткізгіштілігінен жоғары екендігі анықталды. Өлшеу нәтижелері Сыртқы қысымның әсерінен су көлемінде полярлы емес монокластерлік құрылымдардың пайда болуы туралы теорияның болуын дәлелдеуі мүмкін.

Түйінді сөздер: электр өткізгіштігі, ағынды су, қайнаған су, судың қасиеті, судың электр өткізгіштігі.

Introduction

It is known that water in its pure form is a dielectric until impurities appear in it, which dissociate into conductive ions. The same theory speaks of the dependence of the concentration of free ions and electrical conductivity. However, there is an assumption that non – polar monoclusters exist in the volume of water (probably occur under pressure), the conductivity is low or even zero. If in reality there are such structures, then the conductivity of water should increase with different methods of its treatment. Previously, studies have been conducted showing an increase in the conductivity of water in after its treatment [1]. For more convincing evidence (there was a suspicion of microorganism interference), the experiments were repeated with a decrease in time, i.e. cooling water after heat treatment.

The experiment was carried out in the laboratory of nanostructuring of liquid media at the North Kazakhstan State University named after Manash Kozybayev. Two types of water were used for the experiments: 1) boiled water, 2) running water; electrodes, multimeters (ammeter, voltmeter), a source of alternating current with a frequency of 50 Hz, two glass vessels with a volume of 700 ml.

Initially, samples were taken in different vessels boiled and running water, then left for a while until the water reaches room temperature. In this case, the vessels were located at a distance of 3 meters from each other and were isolated from sunlight. The process of removing the volt – ampere characteristic took place as follows: electrodes connected to a current source and a multimeter were placed in a vessel with cooled boiled water, gradually changing the voltage (from 2 V to 20 V), the current was measured.

For the accuracy of the experiment, measurements were carried out several times, while waiting for the electrodes to dry and only then placing them again in the water and waiting for about 30 seconds for the electrodes to wet. The same was done with running water. The obtained values were entered into an Excel document and processed data directly in it. Measurements were taken in the afternoon. Examples of measurements are presented below in tables 1, 2, 3, 4.

Table 1 The measurements were made 02.22.19 (boiled water)

Measurement number	*Electrode voltage value, V*	*The average value of the current on the electrodes, A*	*Ohmic resistance, Ohm*
1	2	0,08	25
2	3	0,12	25
3	4	0,156667	25,53191
4	5	0,2	25
5	6	0,24	25
6	7	0,28	25
7	8	0,32	25
8	9	0,356667	25,23364

9	10	0,396667	25,21008
10	11	0,443333	24,81203
11	12	0,476667	25,17483
12	13	0,52	25
13	14	0,566667	24,70588
14	15	0,606667	24,72527
15	16	0,653333	24,4898
16	17	0,696667	24,40191
17	18	0,736667	24,43439
18	19	0,76	25
19	20	0,826667	24,19355

Table 2 The measurements were made 02.22.19 (running water)

Measurement number	*Electrode voltage value, V*	*The average value of the current on the electrodes, A*	*Ohmic resistance, Ohm*
1	2	0,07	28,57143
2	3	0,103333	29,03226
3	4	0,143333	27,90698
4	5	0,173333	28,84615
5	6	0,216667	27,69231
6	7	0,253333	27,63158
7	8	0,293333	27,27273
8	9	0,33	27,27273
9	10	0,363333	27,52294
10	11	0,413333	26,6129
11	12	0,446667	26,86567
12	13	0,486667	26,71233
13	14	0,526667	26,58228
14	15	0,56	26,78571
15	16	0,603333	26,51934
16	17	0,643333	26,42487
17	18	0,683333	26,34146
18	19	0,72	26,38889
19	20	0,76	26,31579

Table 3 Measurements were taken on February 27, 1919 (boiled water)

Measurement number	*Electrode voltage value, V*	*The average value of the current on the electrodes, A*	*Ohmic resistance, Ohm*
1	2	0,086667	23,07692
2	3	0,133333	22,5
3	4	0,19	21,05263

4	5	0,243333	20,54795
5	6	0,29	20,68966
6	7	0,35	20
7	8	0,386667	20,68966
8	9	0,443333	20,30075
9	10	0,486667	20,54795
10	11	0,54	20,37037
11	12	0,59	20,33898
12	13	0,646667	20,10309
13	14	0,696667	20,09569
14	15	0,746667	20,08929
15	16	0,81	19,75309
16	17	0,86	19,76744
17	18	0,913333	19,70803
18	19	0,963333	19,72318
19	20	1,016667	19,67213

Table 4 Measurements were made on February 27, 1919 (running water)

Measurement number	*Electrode voltage value, V*	*The average value of the current on the electrodes, A*	*Ohmic resistance, Ohm*
1	2	0,07	28,57143
2	3	0,113333	26,47059
3	4	0,15	26,66667
4	5	0,19	26,31579
5	6	0,23	26,08696
6	7	0,27	25,92593
7	8	0,31	25,80645
8	9	0,343333	26,21359
9	10	0,383333	26,08696
10	11	0,43	25,5814
11	12	0,466667	25,71429
12	13	0,503333	25,82781
13	14	0,543333	25,76687
14	15	0,583333	25,71429
15	16	0,626667	25,53191
16	17	0,666667	25,5
17	18	0,706667	25,4717
18	19	0,746667	25,44643
19	20	0,79	25,31646

According to the data obtained in the course of the experiment, graphs were drawn showing the dependence of the current strength on the voltage and you can clearly see the differences in the current conductivity of boiled and running water (Figure 1, 2).

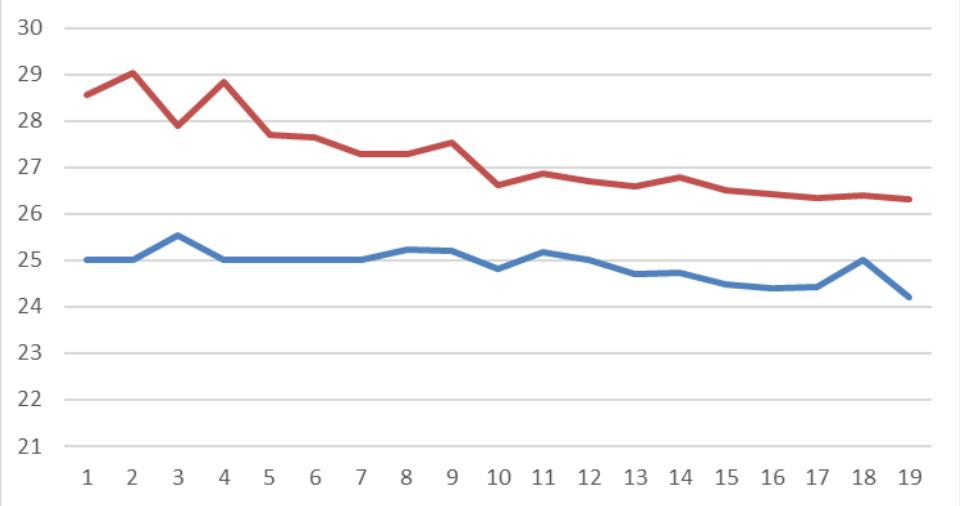

Figure 1 Current dependence on voltage (on a vertical scale, current values on coal electrodes in milliamperes are deposited, the value in volts on electrodes is plotted horizontally; the upper graph corresponds to the resistance of boiled water, the lower graph corresponds to the resistance of running water) (02.22.19)

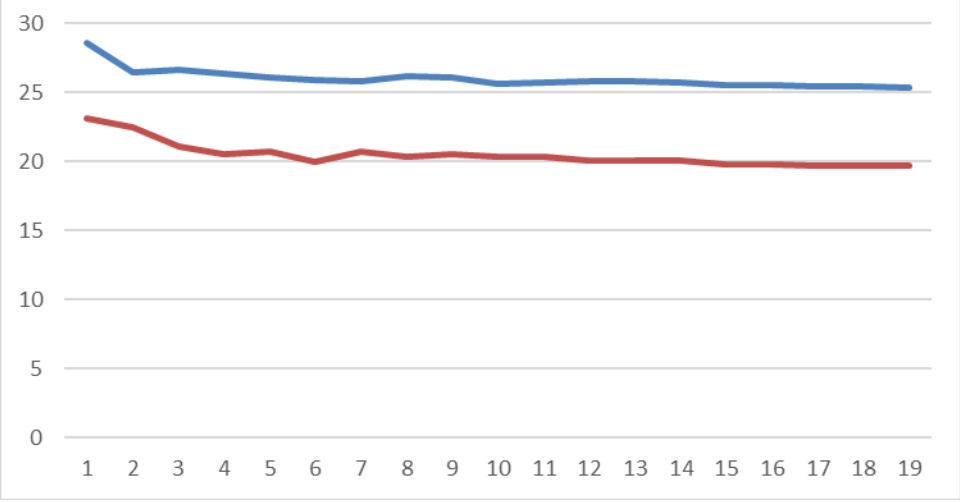

Figure 1 Current dependence on voltage (on a vertical scale, current values on coal electrodes in milliamperes are deposited, value in volts on electrodes is plotted horizontally; the upper graph corresponds to boiled water resistance, the lower graph corresponds to the resistance of running water) (02.27.2019)

Conclusion

This experiment showed that the electrical conductivity of water after boiling increases. This suggests the possibility of the existence of a theory about neutral mono – cluster

structures in the volume of water, which impede the passage of current and collapse during boiling.

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