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Spectral Analyses of Water ADVA. Biophysical, Biochemical and Biological Effects

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Abstract

Studies were performed with water ADVA. The analyses have been conducted with Nonequilibrium Energy Spectrum (NES) and Differential Nonequilibrium Energy Spectrum (DNES) methods (Antonov, 1995; Ignatov, 1998). Increasing of DNES spectrum of water ADVA according to the control sample was observed. The NES and DNES spectrum were in the range (-0.08 – -0.14 eV) (8.9 – 15.5 μm) (645–1129 cm⁻¹).

The parameters of the following local extremums were studied:

E=-0.1112 eV (λ=11.15 μm)(ν̃=897 cm⁻¹) is the local extremum for stimulating effect on nervous system and improvement of nervous conductivity.

E=-0.1212 eV (λ=10.23 μm)(ν̃=978 cm⁻¹) is the local extremum for anti inflammatory effect.

E= -0.1387 eV (λ=8.95 μm)(ν̃=1117 cm⁻¹) is the local extremum for inhibition of development of tumor cells of molecular level.

Keywords: Water ADVA, NES, DNES, biophysical, biochemical and biological effects.

1. Introduction

The research is conducted using spectral methods NES and DNES (Antonov, 1995; Ignatov, 1998). The methods NES and DNES show the parameters of electromagnetic hydrogen bonds of O–H...O–H groups of water molecules. For this purpose the model of W. Luck is used, which consider water as an associated liquid, consisted of O–H...O–H groups (Luck et al., 1980). The major part of these groups is designated by the energy of hydrogen bonds (-E), while the others are free (E = 0).

The spectral analyses with methods NES and DNES are conducted with control sample of tap water from Stara Zagora region, Bulgaria and water ADVA. The water ADVA was made with process of electromagnetic activation and cleaning with system of bio security.

2. Materials and Methods

2.1. NES and DNES Spectral Analyses

The device for DNES spectral analysis based on an optical principle was designed by A. Antonov. For this, a hermetic camera for evaporation of water drops under stable temperature (+22–24 °C) conditions was used. The water drops were placed on a water-proof transparent pad, which consisted of thin maylar folio and a glass plate. The light was monochromatic with filter for yellow color with wavelength at λ = 580±7 nm. The device measures the angle of evaporation of water drops from 72.3° to 0°. The DNES-spectrum was measured in the range of -0.08– -0.1387 eV or λ = 8.9–13.8 μm using a specially designed computer program. The main estimation criterion in

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these studies was the average energy ($\Delta E_{H...O}$) of hydrogen O...H-bonds among H_2O molecules in water samples.

2.2. Statistical analyses with methods of Student and Fisher

The studies of tap water from Stara Zagora region, Bulgaria and ADVA water were performed each month,

The results were calculated with statistical methods of Student and Fisher.

3. Results and discussion

3.1. Parameters of NES and DNES spectrums of ADVA water

The spectrum analysis is conducted with tap water from Stara Zagora region, Bulgaria and ADVA water. The energy spectrum of water is characterized by a non-equilibrium process of water droplets evaporation; therefore, the term non-equilibrium spectrum (NES) of water is used.

The difference $\Delta f(E) = f(\text{samples of water}) - f(\text{control sample of water})$ is called the "differential non-equilibrium energy spectrum of water" (DNES). The Figure 1 shows that on the X-axis are depicted three scales. The energies of hydrogen bonds among H_2O molecules are calculated in electronvolts (eV). On the Y-axis is depicted the function of distribution of H_2O molecules according to energies $f(E)$, measured in reciprocal electronvolts unit eV^{-1} . The local extremums of water samples are detected at $E = -0.1112$ eV, $E = -0.1212$ eV and $E = -0.1387$ eV. The value measured at $E = -0.1212$ eV is characteristic for anti-inflammatory effect (Ignatov et al., 2014). The value measured at $E = -0.1112$ eV is characteristic for the presence of Ca^{2+} ions in water (Antonov, 1995). The value measured at $E = -0.1387$ eV is characteristic for inhibiting the growth of tumor cells (Ignatov, Mosin, 2012). Experiments conducted by Antonov with cancer cells of mice in water demonstrated a reduction of this local extremum to a negative value in DNES spectra.

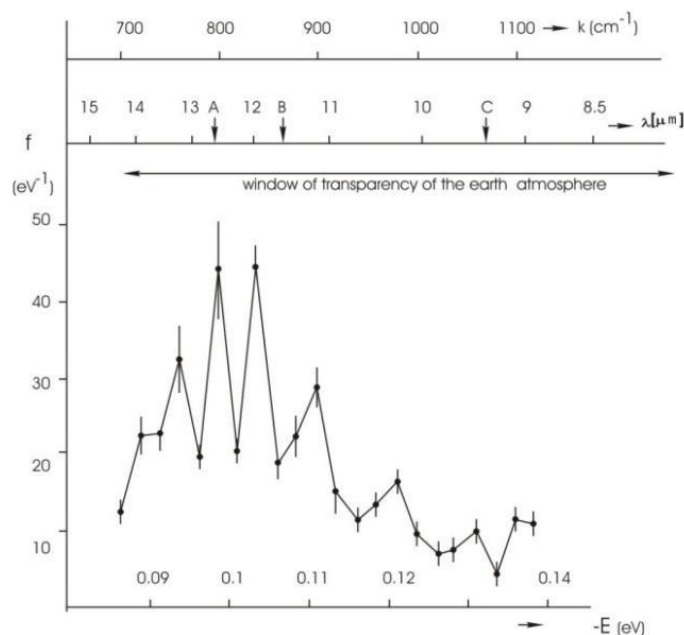


Fig. 1. The NES-spectrum of deionized water (chemical purity – 99.99 %; pH – 6,0–7,5; electric conductivity – 10 $\mu S/cm$): the horizontal axis shows the energy of the H...O hydrogen bonds in the associates ($-E$ (eV)); the vertical axis – the energy distribution function – f (eV^{-1}); k – the vibration frequency of the H–O–H atoms (cm^{-1}); λ – wavelength (μm)

The following results of the effects of ADVA water with NES and DNES methods are obtained:

The difference of DNES spectra between ADVA water and Control Sample of Tap water is $\Delta E = (-0.1207 \text{ eV}) - (-0.1127 \text{ eV}) = -8.0 \pm 1,1 \text{ meV}$.

The difference is essential and shows biophysical and biochemical effects of molecular and cell level.

The result is essential for increasing of average value of hydrogen bonds among water molecules in water ADVA with result $\Delta E = -8.0 \pm 1,1 \text{ meV}$ according tap water.

3.2. The mathematical models of ADVA water

The mathematical model of ADVA water gives valuable information for the possible number of hydrogen bonds as percent of H₂O molecules with different values of distribution of energies (Table 1 and Figure 2). These distributions are basically connected with the restructuring of H₂O molecules having the same energies.

The average energy ($E_{H...O}$) of hydrogen H...O- bonds among H₂O molecules of the samples of ADVA water and Tap water (Control Sample):

–The result of NES for ADVA water is $E = -0.1207$ eV;

–The result of NES for Tap water (Control Sample) is $E = -0.1127$ eV.

The Table 1 and Figure 2 show the mathematical Models of ADVA water and Tap water (Control Sample).

Table 1. Mathematical Models of ADVA water and Tap water (Control Sample)

-E(eV) x-axis	Water ADVA (%((-E _{value}) [*] / (-E _{total value}) ^{**})	Control Sample Tap water (%((-E _{value}) [*] / (-E _{total value}) ^{**})	-E(eV) x-axis	Water ADVA (%((-E _{value}) [*] / (-E _{total value}) ^{**})	Control Sample Tap water (%((-E _{value}) [*] / (-E _{total value}) ^{**})
0.0937	0	15.3	0.1187	0	0
0.0962	0	5.1	0.1212	16.8 ²	5.1 ²
0.0987	4.2	5.1	0.1237	0	0
0.1012	0	5.1	0.1262	16.8	5.1
0.1037	0	5.1	0.1287	12.6	5.1
0.1062	4.2	10.2	0.1312	4.2	5.1
0.1087	4.2	0	0.1337	4.2	5.1
0.1112	16.8 ¹	5.1 ¹	0.1362	0	0
0.1137	0	5.1	0.1387	7.6 ³	8.2 ³
0.1162	8.4	10.2	–	–	–

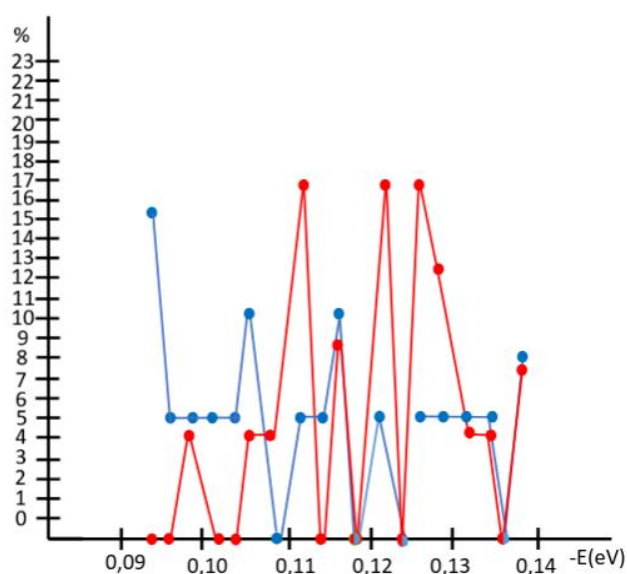


Fig. 2. Mathematical Models of water ADVA (red color) and Tap water (blue color)

Notes:

E=-0.1112 eV is the local extremum for stimulating effect on nervous system and improvement of nervous conductivity.

E=-0.1212 eV is the local extremum for anti inflammatory effect.

E= -0.1387 eV is the local extremum for inhibition of development of tumor cells of molecular level.

* (-E_{value}) stands for the value of hydrogen bonds energy for one parameter of (-E).

** (-E_{total value}) stands for the total value of hydrogen bonds energy.

Table 1 and Figure 2 shows the distribution (% (-E_{value})/(-E_{total value})) of H₂O molecules of Water ADVA and Tap water (control sample) respectively.

E=-0.1112 eV is the local extremum for stimulating effect on nervous system and improvement of nervous conductivity. The effect of Water ADVA is 16.8 % and for Control sample is 5.1 %

E=-0.1212 eV is the local extremum for anti inflammatory effect. The effect of Water ADVA is 16.8 % and for Control sample is 5.1 %

4. Conclusion

The results are shown restructuring of water molecules in configurations of clusters, which have influence successful on human health of molecular and cell level. The biophysical and biochemical effects are base for biological effects.

Non-equilibrium energy spectrum (NES) and Differential non-equilibrium energy spectrum (DNES) of water ADVA have shown effects on nervous system and conductivity of nervous tissue. There have anti inflammatory effects. These effects together with big alteration of energy of hydrogen bonds have led to detox and anti aging effects.

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