

The Physicochemical Study of Highly Diluted Aqueous Solutions.

The Effects of Ultra-low Concentrations and Electromagnetic Fields.

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Plenty of bioactive compounds show bio-effects in water solutions in two regions of concentrations: in usual and low (10^{-2} - 10^{-7} M) and in ultra-low (10^{-12} - 10^{-20} M). We have supposed that the reason of this phenomenon can be caused by different states of solutions in all over interval concentrations.

Therefore the study of water solutions of different nature solutes in wide region of concentrations was realized by complex physicochemical methods: dynamic light scattering, electrophoresis, electro-conductivity, surface tension-metry, pH – metry, polarimetry and TEM. Measurements were made in normal and in hypo-electromagnetic (in permalloy box) conditions.

As the result, «the effect of ultra-low concentration and electromagnetic fields» was discovered. It consists in formation of nano-sized (up to 400 nm, ζ -potential up to -20mV) associates («nano-associates») in ultra-diluted water solutions and only by presence of external electromagnetic fields. The main part of such «nano-associates» is water. It was established that changes of «nano-associates» properties (size and ζ -potential) depending on solute concentration determine changes of physicochemical and biological properties of such solutions. There are substances either able or not able to show this effect.

Literature: Doklady Biochemistry and Biophysics, 2009, Vol. 429, pp. 301–304; Doklady Physical Chemistry, 2009, Vol. 428, Part 2, pp. 196–200; 2009, Vol. 428, Part 2, pp. 201–205; 2010, Vol. 433, Part 2, pp. 142–146; 2011, Vol. 438, Part 1, pp. 98–102; 2011, Vol. 438, Part 2, pp. 109–113; 2011, Vol. 440, Part 2, pp. 201–204; 2011, Vol. 440, Part 1, pp. 157–161; Mendeleev Commun. -2010. -№ 20.- C. 148-150; Chemical Physics Letters.-2011.-V.511.- P.247-250.

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