Nanocomposites and nanomaterials

The coherent properties of water in one-dimensional and two-dimensional nanosystems

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For the last decades a breakthrough was carried out in the study of properties of water. The effect of the resonance interaction of electromagnetic waves of mm-range with water and water environments was opened. N.Devjatkov on the basis of the experimental spectra has offered the theory of a structure of usual water. In this theory water will consist from two phases - «ice-like» waters and the water consisting of usual water molecules which surrounds the «ice-like» phase.

The new model of water from a position of the quantum theory of a field was formulated by outstanding Italian researcher J.Preparata. He has shown that usual water will consist from two fractions - not coherent and coherent which simultaneously coexist, but are in "flickering" mode.

In one-dimensional and two-dimensional nanosystems the water coherent states can be kept for long time (about several days and more).

The theories of N..Devjatkov and J..Preparata do not contradict each other and to experimental data, but supplement each other. *However there are also differences.* If in N,.Devjatkova's theory «ice-like» phase of water represents a certain crystal structure, in J.Preparata's theory it is « the coherent domain » (CD)!

In work [1] it is underlined: “The spectrum of the water CD is extremely rich; the spacing among levels is in the ***order of radio-waves*** **(*mm*-waves).**

The comparison of these theories allows to make the assumption about of the possible nature of resonant spectra of the EHF-range (mm-waves) as a result of energy transitions between levels in СД in which is shown *a crystals-like structure of СД, that is caused by presence for them the hydrogen bindings* predicted by the theory of J.Preparata.

For the first time the assumption of presence of possible structure in СД is put forward and the treatment of the possible nature of resonant spectra of the EHF-range is given.

1 Del Giudice, and G.Vitiello. Influence of Gravity on the Collective Molecular Dynamics of Liquid Water: The Case of the Floating Water Bridgeton. 2011.WATER.