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WATER AS THE MOST IMPORTANT COMPONENT FOR THE MAINTENANCE OF THE LIFE FOR WARM BLOODED ORGANISMS

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Weighty arguments about the existence of the dynamic phase transition in water at $T_H \approx 42^0 C$ are given in the work. The essential change of the character of the thermal motion takes place at this temperature: the crystal-like character transforms to argon-like one. This phenomenon is manifested in peculiarities of the quasi-elastic incoherent neutron scattering, as well as in the behavior of the isothermal compressibility, the entropy diameter for the vapor-liquid coexistence curve, shear viscosity and other properties. It is shown that the similar phase transition is also observed at the same temperature in solutions water-Mioglobin. They can be considered as a model of intracellular water. The shift of the characteristic temperature T_H under influence of small quantities of glycerol is investigated. It is proposed that the dynamic phase transition takes

also place in the intracellular water, where it stimulates the denaturation of protein chains and the death of warm-blooded organisms. It is shown that the denaturation of proteins is caused by the reconstruction of the H-bond network in both the intracellular and extracellular water. The estimate for the denaturation temperature is obtained. A question why the heavy water cannot be a matrix for the intracellular and extracellular fluids is considered. The lower physiological pH limit for living the warm-blooded organisms is discussed.

References

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