

Properties of Proton Transfer in Hydrogen-Bonded Systems at Finite Temperature

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Abstract: The properties of proton transfer along hydrogen-bonded molecular systems are studied at finite temperature. The dynamic equations of the proton transport along the systems are obtained by using a completely quantum mechanics method. From the dynamic equations and its soliton solutions we find out specific heat arising from the motion of solitons in the systems with finite temperature and the critical temperature of the soliton in the protein molecules, which is about 318 K. This shows that we can continuously study some biological phenomena in the living systems by this model.

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Key words: proton transfer, hydrogen bond, critical temperature, specific heat

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