Calculation of Vibrational Energy-Spectra of α-Helical Protein Molecules and Its Properties

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Abstract: The quantum vibrational energy-spectra of amide-Is in alpha-protein molecules are calculated by using the discretely nonlinear Schrödinger equation and physical parameters appropriate to the systems on the basis of theory of bio-energy transport. The numerical results for the energy-spectra are basically consistent with the experimental values obtained by the infrared absorption and Raman scattering and emission-spectra of infrared lights of person's hand-fingers. Utilizing the energy-spectra we explain the laser-Raman spectrum from metabolically active E. Coli. and give some features of the infrared absorption of the protein molecules.

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