

ION MODE IN THE DNA LOW-FREQUENCY VIBRATION SPECTRA

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S u m m a r y

The vibrational dynamics of a DNA molecule with counterions neutralizing the charged phosphate groups has been studied. With the help of the elaborated model, the conformational vibrations of a DNA double helix with alkaline metal ions have been described both qualitatively and quantitatively. For the complexes of DNA with counterions Li^+ , Na^+ , K^+ , Rb^+ , and Cs^+ , the normal modes have been found, and a mode characterized by the most notable ion displacements with respect to the DNA backbone has been determined. The vibration frequency of counterions has been established to decrease as the ion mass increases. The results of theoretical calculations are shown to be in good agreement with the experimental data of Raman spectroscopy.