INTRINSICALLY INDUCED DEFORMATION OF A DNA MACROMOLECULE

P.P. Kanevska, S.N. Volkov

M.M. Bogolyubov Institute for Theoretical Physics,
Nat. Acad. Sci. of Ukraine
(*14b, Metrolohichna Str., Kyiv 03143, Ukraine;*
e-mail: kanevska@bitp.kiev.ua)

S u m m a r y

The mechanism of the macroscopic bending deformation of a macromolecular chain of the DNA type due to a conformational transformation of the double helix has been substantiated. In the framework of the two-component nonlinear model of conformational transformations of DNA, the shape of a deformed fragment and the energy of its deformation have been found. The estimations of the energy and the amplitude of the bending deformation demonstrate that the deformation of DNA induced by conformational transformations is energy-gained in comparison with that resulting from the elastic mechanism of a bending. Confronting the theoretical results with experimental ones obtained for the anomalous bending of the TATA-box fragment of DNA testifies that the mechanism of the intrinsically induced deformation may be realized for a certain sequence of DNA fragments.