

Optimizing DNA visualization with a solver P47H atomic-force microscope

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Abstract

The conditions for visualizing DNA molecules with a Solver P47H atomic-force microscope (NT-MTD, Moscow, Russia) were optimized. The DNA samples had different sizes, types, and conformations (pBR-322 plasmid DNA and chicken erythrocyte DNA) and were immobilized on mica. The microscope was equipped with a Smena-B detecting head and was operated in a tapping mode. The dependence of the amplitude of tip oscillations on the spacing between the tip and the test sample's surface was used to determine the optimum parameters of scanning. The highest quality and reproducibility of the DNA images were attained by scanning with a small initial amplitude (9-23 nm) of cantilever oscillations and an optimum gain (0.08-0.3). Images with the highest contrast were obtained in the amplitude curve's region corresponding to a repulsive interaction regime. The operating amplitude was set at one-half (or slightly less than) the initial amplitude of tip oscillations. © 2005 Pleiades Publishing, Inc.

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