

“The book at hand is a marvelous collection of the high-quality reports by a number of outstanding experimenters and theorists in one of the hottest research fields of nowadays. The editors have exerted a truly great effort to demonstrate the eternal verity of R. A. Millikan’s known saying, ‘Science walks forward on two feet, namely theory and experiment, but continuous progress is only made by the use of both.’ This volume ought to be of clear interest not only for freshmen, but also to the colleagues truly versed in the field.”

Dr. Evgeni B. Starikov
KIT Karlsruhe, Germany
Chalmers University of Technology, Sweden

DNA is one of the most known, interesting, and important materials in the world. It is not only a container of hereditary information of lives but also a fascinating nanomaterial with self-organization ability with base pairing, flexibility of base sequence, π -electron band formation, flexibility of intercalation with flat molecules, property control with water molecules, and so on. DNA as a nanomaterial has the potential to open a new horizon of applications in the near future.

This book presents basic information about DNA, along with comprehensive theoretical introduction to DNA. It discusses recent developments in divalent metal ion-inserted M-DNA complex, which gives rise to the possibility of DNA application to electronic functionality. Further, the book describes three examples of applications: optical and electrical materials, electronic devices such as bioTFT memory and color-tunable light-emitting diodes, and biofuel cell application with use of proton conduction in DNA.



Kenji Mizoguchi is emeritus professor at Tokyo Metropolitan University (TMU), Japan. He joined TMU as professor in the Department of Physics in 1995. He received his PhD from TMU in 1983 on the topic “NMR study on AuV and MoCo dilute magnetic alloys.” Some of his prominent studies are “NMR and ESR study on conducting polymers” (1980), “Electrosodalites, fullerenes, molecular charge transfer salts” (2000), and “DNA and metal-DNA composites” (since 2002). He has published nearly 150 research papers so far. His current research interest is in the development of a high-pressure ESR system up to 10 GPa.



Hirokazu Sakamoto is assistant professor at TMU since 1986. He received his PhD from the University of Tokyo in 1985 on the topic “Electronic states of transition metal compounds by ultraviolet and photoemission spectroscopy.” His research is focused on photoemission and ultraviolet spectroscopy of molecular crystals, semiconductors, and metals and NMR and ESR of high- T_c superconductors, conducting polymers, charge transfer salts, and DNA. His current research interest is in the high-pressure ESR system being studied by Prof. Mizoguchi.

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