

1E1s

New spin dependent processes in physics, chemistry and molecular biology.

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Electron spins in radical pairs are known to determine rates and reaction yields due to spin selection rules which govern elementary steps of chemical reactions. Spin dependence of radical reactions is the origin of many fine and useful effects: magnetic field effects (MFE) on chemical reactions, chemically induced dynamic nuclear polarization (CIDNP), magnetic isotope effect (MIE), effects of radiofrequency field on chemical reactions (generation and receiving), etc. However, the main ideas of spin chemistry had appeared to be of heuristic value for many other branches of physics (spintronics, for example) and molecular biology, and gives the new breath to fundamental problems of quantum physics (Quantum Zeno effect) and quantum informatics (entanglement of spin states).

The lecture will give the revue of main ideas of spin chemistry and its applications in semiconductor spintronics, in molecular biology (effects of magnetic isotopes on living organisms) and biological magnetoreception.