Superconductivity in Long and Short Molecules
ALEKBER KASUMOV, Laboratoire de Physique des Solides, Universite Paris-Sud, 91405 Orsay, France

We present the results of experimental study of superconductivity in individual molecules of carbon nanotubes [1,2], DNAs [3] and metallofullerenes [4]. Critical currents of superconductor-molecule-superconductor junctions were extensively studied as a function of temperature and magnetic field. The mechanism of current induced superconductor-normal state transition for a long molecule (carbon nanotubes and DNAs) is the creation of phase slip centers and for a short molecule (metallofullerenes) – multiple Andreev reflections. We observe an influence of spin state of encapsulated atom on the induced superconductivity in a metallofullerene molecule.