Investigation of High Temperature Superconductors

High-temperature superconductivity is one of the most important new technologies in the 21st century, where mankind focuses its efforts on energy, resources, and the environment. Superconducting property causes certain materials, at low temperatures, to lose all resistance to the flow of electricity. This state of losslessness enables a range of innovative technology applications in the sectors of electric power, transportation, medicine, etc. Enhancement of the current carrying capacity and acceleration of the superconducting phase formation is the main requirement for large-scale technological applications of high-temperature superconductors such as superconducting wires, films, superconducting permanent magnets, etc. Highly promising results in this direction were obtained by Project team. According to these data, appropriate doping markedly enhances the critical current density and drastically accelerates formation of the bismuth-based superconductor. Based on these results, the project participants as intellectual property owners have received 4 patents from the National Intellectual Property Center of Georgia (Sakpatenti). Motivated by own findings, research team is going to apply a novel approach to fabricate high performance bismuth-based high temperature superconducting materials based on the combination of doping and nanoscale level-engineering techniques. The first-priority objective of these investigations is to create an advanced, cheap and energy efficient technology which controls the fabrication of high-temperature superconducting materials with higher current-carrying capacity and higher rate of phase formation compared to the conventional technology.

maRaltemperaturuli zegamtarebis კვლევა

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