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Local properties study of substituted Sr-Ca-Cu-O superconducting structure

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In this work, the study of superconducting Sr-Ca-Cu-O layered system is presented. Study object is $02(n-1)n$ compound (critical temperature around 100-110 K) which shows some interesting properties like instability in moisturized air and possibility to entrance of water or carbon into the sample structure between layers. Entrance of alien atoms into the structure may lead to the appearance of some interesting properties like asymmetry in hysteresis M vs. H curves due to the magnetic-field irreversibility. The local properties study in both superconducting and block layers may help to clarify the question of air moisture influence on the hyperfine properties of these materials. Hyperfine properties study requires introducing into investigated samples some amount of substituent atoms which is used as a probe. There are several possibilities to add substituent elements inside Sr-Ca-Cu-O superconductor structure: Substitution of a small amount of copper or calcium inside superconducting layers or substitution of a part of strontium atoms inside block layers. Here the effect of introducing of iron and europium into superconducting and block layers was studied. Systems with general formulas of $\text{Sr}_2\text{CaCu}_{1-x}\text{Fe}_x\text{O}_{6\pm\delta}$ and $\text{Sr}_{2-x}\text{Eu}_x\text{CaCu}_2\text{O}_{6\pm\delta}$ have been produced and investigated.

Biography

A Sklyarova has completed her PhD from Lappeenranta University of Technology, Finland, 2015. Fields of her interest are: Superconductivity, magnetism, Mossbauer spectroscopy, NMR, iron-based and copper-based superconductors and inorganic material synthesis.

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