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Micro-mechanical and Structural Properties and Activation Energy Calculation of Nd_2O_3 Added $\text{Bi}_2\text{Sr}_2\text{Ca}_1\text{Cu}_2\text{O}_y$ Superconducting System OZGUR OZTURK, ELIF ASIKUZUN, MURAT COSKUNYUREK, SEYDANUR KAYA, Kastamonu University, Department of Physics 37100 Kastamonu-Turkey, MUSTAFA YILMAZLAR, Faculty of Education, Sakarya University 54300 Hendek, Sakarya-Turkey, GURCAN YILDIRIM, CABIR TERZIOGLU, Abant Izzet Baysal University, Department of Physics 14280 Bolu-Turkey — Nd added Bi-2212 superconducting samples with $x=0, 0.001, 0.005, 0.01, 0.05$ and 0.1 were prepared by conventional solid state reaction method and annealed at 840°C for 72 h. For the comparison, an undoped sample was produced to the same conditions. The effects of Nd addition on structural and micromechanical properties were systematically investigated. The volume fraction, lattice parameters, crystal structure and grain size of the samples were characterized using the X-ray diffractometer and Scanning Electron Microscope. In addition, this study includes determination of the activation energy of Nd in the Bi-2212 system using the magnetoresistivity measurements. And also, we were investigated the mechanical properties for all samples using the Vickers microhardness measurements. Microhardness values of the samples decrease with increasing adding and applied load. The Vickers hardness of the samples studied, exhibits the typical indentation size effect (ISE).

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