

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Investigation of Indentation Size Effect (ISE) of $\text{Bi}_2\text{Sr}_2\text{CaNd}_x\text{Cu}_2\text{O}_y$ Superconducting System using Vickers Microhardness Test Method ELIF ASIKUZUN, OZGUR OZTURK, SEYDANUR KAYA, MURAT COSKUNYUREK, Kastamonu University, Department of Physics, Kastamonu, Turkey, NEVIN SOYLU, AHMET VARILCI, CABIR TERZIOGLU, Abant Izzet Baysal University, Department of Physics, Bolu, Turkey — In this work, the effects of Nd doping on the structural and mechanical properties of the samples were analyzed. Nd_2O_3 doped Bi-2212 superconductors were obtained using solid state reaction method. Microhardness measurements were made to analyze the mechanical properties. XRD and SEM measurements were done for determination of crystal structure and surface morphology and calculation of the lattice parameters. The Vickers microhardness was calculated for undoped and doped samples. The experimental results of the microhardness measurements were analyzed using Kick's Law, PSR (proportional specimen resistance), modified PRS (MPSR) and Hays-Kendall (HK) approach. The microhardness values of the samples decreased with increasing Nd doping and applied load. Finally, the Hays-Kendall (*HK*) approach was determined as the most successful model describing the mechanical properties of our samples.

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Date submitted: 15 Nov 2012

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