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Observation of a new phase in the Li-B system. EDUARD GALSTYAN, YUYI XUE, YANYI SUN, IRENE RUSAKOVA, TcSUH and Department of Physics, University of Houston, NING WANG, Department of Physics,The Hong Kong University of Science and Technology, KAREN MKHOYAN, Department of Applied and Engineering Physics, Cornell University, CHING-WU CHU, TcSUH, The Hong Kong University of Science and Technology, Lawrence Berkeley National Laboratory — The simple compounds of boron and light elements have attracted interest since the unexpected discovery of high temperature phonon-coupled superconductivity (SC) in MgB_2. The numerous theoretical works show that the Li-B system has electronic features similar to those in MgB_2 and compounds in the system are expected to be superconducting. In fact, there were early reports of Li-B compounds. Although the small Li-size suggests a rich phase-diagram, the previous investigations discovered only one stable compound over a broad initial stoichiometry. The extreme reactivity and hydrolyses of Li in air may be partially responsible for this. We were able to synthesize a new Li-B pure phase that belongs to hexagonal symmetry through a new synthesis procedure. We report on the structural, magnetic, and electron energy loss spectra (EELS) analyses of this compound. Despite the similarity with the electronic structure of MgB_2, the Li-B system has not yet shown the existence of SC.

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