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Thu-Mo-Po4.05-05 [35]: Tensile mechanical properties of silver alloy sheathed Bi-2212 wires

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Bi₂Sr₂CaCu₂O_x (Bi2212) has the excellent current carrying properties at 4.2K and is one of the potential materials for superconducting magnets. In the construction and use of magnets, superconducting wires are subjected to complex stresses, so it is important to determine the mechanical properties of the wires. In this paper, the mechanical properties of Bi-2212 wire before heat treatment and after heat treatment with different pressures were compared and analyzed. The samples are provided by Northwest Institute for Non-ferrous Metal Research (NIN) in China. In order to determine the uncertainty of the experiment and accurately grasp the material properties, round-robin-tests were performed in different laboratories. It was found that the higher the heat treatment pressure, the better the mechanical properties of the sample. Besides, the strain hardening phenomenon was observed on the un-reacted wire at 4.2K. This paper summarizes the effects of heat treatment on the mechanical properties of Bi-2212, which provides a reference for material applications.

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