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Wed-Af-Po3.25-12 [115]: Electro-mechanical properties of multifilamentary Ba_{0.6}K_{0.4}Fe₂As₂ tapes

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Iron-based superconductors (IBS) are attractive for high-field applications due to the good performances including high upper critical field and low anisotropy. This work describes electro-mechanical properties of the silver-sheathed multifilamentary Ba_{0.6}K_{0.4}Fe₂As₂ (Ba-122) tape. This tape was fabricated by the ex-situ powder-in-tube (PIT) method and the number of filaments is 7. In order to know well the integrated properties, serial measurements have been done on the tape samples at Institute of Plasma Physics, Chinese academy of Sciences (ASIPP). The stress-strain curves were obtained for the free-standing Ba-122 sample at 4.2 K and critical currents have been simultaneously measured without applied magnetic field. The minimum bending radius, which is defined as the minimum radius for the bending sample with no degradation on critical current, has been measured. Combining the critical current results as function of axial strain using the so called U-spring testing device and thermo expansion properties for the based materials, the electro-mechanical properties have been analyzed for the 7-filamentary tape. Besides, the critical current characteristics as function of magnetic field B and temperature T for the tape have been measured and analyzed.

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