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Superconducting properties of MoN microfibers and thin films[1]
AMAR KARKI, LSU Department of Physics and Astronomy, EDEM OKUDZETO, LSU Department of Chemistry, PHIL ADAMS, DAVID YOUNG, LSU Department of Physics and Astronomy — We present the superconducting transport properties measurements on polycrystalline MoN synthesized in the form of thin films and microfibers. The samples were prepared by heating Mo films and Mo-coated carbon fibers to temperatures between 850 ^{o}C and 1000 ^{o}C for different time periods in a flowing stream of ammonia (NH_3) gas under atmospheric pressure. The microfibers and thin films had a transition temperature Tc $\sim$ 12.2 K, which is substantially higher than that reported for MoN films grown by other methods. We also present critical current measurements on microfibers which consisted of a 50-nm thick layer of polycrystalline MoN synthesized directly onto 5 micron-diameter carbon fibers. The microfibers supported current densities in excess of 10^7 A/cm^2 well below Tc. Near Tc, Jc was well described by the power law $[1\text{-}(T/Tc)^2]^{3/2}$.

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