Superconductivity in magnesium diboride thin films

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Abstract

Mg–B thin films were grown in situ on (1 0 0) $SrTiO_3$ substrates by pulsed laser deposition. Targets pressed from a commercial MgB_2 powder had a superconducting transition temperature of 37 K. Films were characterized by atomic force microscopy and susceptibility measurements. First samples showed superconducting onset at 30 K and became superconducting at about 20 K. Films were patterned into microbridges 4–100 μm wide by Ar ion beam milling. Films had large contact resistances, of the order of 500Ω cm^2 in the temperature range 4.2–300 K.

Keywords

Magnesium diboride;
Thin films;
In situ;
Superconductivity