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MgB₂ thin films for SRF cavity applications

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MgB₂ thin films grown by hybrid physical-chemical vapor deposition (HPCVD) have been investigated for SRF cavity applications. Clean MgB₂ thin films have a low residual resistivity ($<0.1 \mu\Omega\text{cm}$) and a high T_c of 40 K, promising a low BCS surface resistance. Its thermodynamic critical field H_c is higher than Nb, potentially leading to a higher maximum accelerating field. The lower critical field H_{c1} , which marks the vortex penetration into the superconductor and the vortex motion related dissipation, is lower for MgB₂ than Nb, but it can be enhanced by decreasing the film thickness. I will present results on the enhancement of H_{c1} in thin MgB₂ films and coatings, deposition of MgB₂ films on Cu, and the coating of RF cavities by MgB₂. These results are encouraging for the application of MgB₂ for SRF cavities.

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