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Progress on MgB₂ coating for Cu superconducting RF cavities

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With a higher T_c and higher critical field H_c than Nb and many Nb compounds and alloys, MgB₂ is anticipated to be a promising material to be used for superconducting RF (SRF) cavities at ~ 20 K. We report our continuing effort towards MgB₂ coated SRF cavities. MgB₂ films as thick as 5 μm were coated on 1.3 GHz TESLA type Cu RF cavities by hybrid physical-chemical vapor deposition (HPCVD). The mock cavities were home-made by deep drawing. A pair of clamshell resistive heaters were employed to heat the cavity through conduction. Generations of Mg heaters were designed and tested. MgB₂ films grown on 1 cm \times 1 cm Cu substrates attached on the inside wall of cavities show T_c up to 34 K, measured by AC susceptibility [1]. Recent efforts of moving the Mg and B sources to coat MgB₂ more uniformly and making RF surface resistance measurement are underway.

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