



FIG. 10.5 Critical-current density as a function of magnetic field for a number of high-current-density superconductors at *liquid-helium* temperature (from a compilation by Lee 2002, 2005). The critical-current density J_c is normalized by the superconductor area alone or by the non-stabilizer area, not by the overall conductor area (see definitions in Sec. 9.1.2). Note that the high- T_c superconductors are very anisotropic with respect to magnetic-field orientation, with J_c being much higher for field parallel to the a,b -axes than to the c -axis of the superconductor. YBCO: /Ni/YSZ $\sim 1\ \mu\text{m}$ thick microbridge (Foltyn et al. 1999); Bi-2223: rolled 85-filament tape (American Superconductor 6/1996); PbSnMo₆S₈ (Chevrel phase): wire with 20 % superconductor in 14-turn coil (Cheggour et al. 1997); Bi-2212: 427-filament round wire (Hasagawa et al. 2000); MgB₂-SiC: 10%-wt SiC doped (Dou et al. 2002); Nb₃Al-Mg: 84-filament RHQT Nb/Al-Mg(0.6 μm) (Iijima et al. 1999); Nb₃Al: DRHQ with intermediate cold work, core J_c (Kikuchi et al. 2001); Nb₃Sn (internal tin): high- J_c design CRE1912, OI-STG (Zhang et al. 1999); Nb-Ti: APC strand Nb-47wt.%Ti with 24vol.%Nb pins (24 nm nominal diameter) (Heussner et al. 1996)