Physica C: Superconductivity and its Applications 1996 vol.260 N3-4, pages 167-172

Microwave studies of the superconducting state in Rb3C60

Ivanshin V., Schauwecker R., Warden M., Erhart P., Keller H., Guentherodt H., Lang H., Thommen-Geiser V.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Methods of electron-spin resonance (ESR) and direct, non-linear field-modulated microwave absorption (FMMA) were applied for the measurements in low-and high-purity samples of rubidium-doped fullerene, Rb3C60. The coexistence of the normal strong ESR signals and regular series of weak absorption lines similar to those seen in systems of Josephson junctions was observed in the high-purity sample. The possible influence of the vortex lattice on the ESR signals was also studied. We determined from FMMA investigations using the Portis model the critical field μ0H * = 40 μT, the depinning current density J*c(μ0H0 = 1 mT) ≈ 4 × 108 A/m2 in low magnetic field and J*c(μ0H0 > 100 mT) ≈ 1.6 × 108 A/m2 in higher fields. These values were generally one order of magnitude higher than the highest corresponding values previously observed in high-temperature superconductors (HTS's).