

Clues Obtained from the Oxygen Isotope Effect on NMR/NQR Parameters Observed in YBa₂Cu₄O₈

Mali M., Roos J., Keller H., Dooglav A., Sakhratov Y., Savinkov A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Nuclear magnetic and nuclear quadrupole resonance (NMR, NQR) techniques have a precision allowing one to determine rather small isotope effects. Well-defined oxygen stoichiometry and negligible oxygen diffusion makes YBa₂Cu₄O₈ an ideal compound for studies of small isotope effects that require experimental results not hampered by reproducibility problems. We report on high-precision measurements of the temperature dependence of plane-63.65Cu NMR/NQR parameters such as Knight shift, spin-lattice relaxation rate $R = 1/T_1$, NQR line frequency ν_Q and NQR linewidth $\delta\nu_Q$, as well as ⁸⁹Y Knight shift, performed in normal and superconducting ¹⁶O and ¹⁸O exchanged YBa₂Cu₄O₈. ©2002 Plenum Publishing Corporation.

Keywords

High temperature superconductivity, Isotope effect, NMR, NQR