

XANES STUDY OF $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ DOPED WITH Ni

N.L. SAINI, K.V.R. RAO, J. SINGH, K.B. GARG, U. CHANDRA,
D.C. JAIN & H.S. CHAUHAN

DEPARTMENT OF PHYSICS, UNIVERSITY OF RAJASTHAN
JAIPUR 302004, INDIA

Progressive doping of the superconducting $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ system with Ni leads to gradual lowering of its T_c . Presence or absence of Cu^{3+} and sites occupied by the dopant atoms are questions that should lead to vital information about mechanism of superconductivity in the high T_c oxides. Moreover, different dopants lead to different rates of suppression of T_c e.g. Zn has been reported to quench it very fast. Using XANES technique we try to first emphasize the absence of Cu^{3+} in these systems and then analyse how doping leads to depletion of oxygen holes, itinerant pairing of which appears to be the cause of the observed superconductivity. One-electron multiple-scattering calculations are also made to investigate the site symmetry of the dopants and their influence on the density of oxygen holes.