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## STUDIES OF IRON IMPURITIES IN Y Pr1-x Ba2 Cu3 O7-6

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Pr is the only rare earth which, when substituted for Y in YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub>, significantly alters the superconducting transition temperature,  $T_c$ , without changing the crystal structure. For  $Y_x Pr_{1-x} Ba_2 Cu_3 O_{7-\delta}$  with  $\delta \approx 0$ ,  $T_c$  is reduced rapidly as x is increased, reaching zero for x about 0.5. For x above 0.5 the compound is antiferromagnetic with a Neel temperature that increases with increasing x, rising to above room temperature for x near 1. A similar behavior is observed when the oxygen deficit  $\delta$  is increased from zero to 1 with x=0. For the case of Pr substitution, the drop in T<sub>c</sub> is believed due to magnetic interactions. For the case of varying  $\delta$  with x=0, the drop can be attributed to a combination of magnetic interactions, band filling, and changes in crystal structure. To study these effects, the Mossbauer effect of <sup>57</sup>Fe atoms substituted for the Cu atoms has been observed as a function of  $\delta$ , x, and temperature. The observed spectra are all well described by a two quadrupolesplit pairs, a central singlet, and a six-line magnetic hyperfine field pattern. For several Pr compositions both  $\delta$  and temperature were varied, and the results support the hypothesis that a magnetic interaction exists between the Fe in the Cu lattice and the substitutional Pr atoms.