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**Enhanced Superconductivity in  $\text{Sr}_2\text{CuO}_{(4-x)}$** <sup>1</sup>

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The cause of the enhanced  $T_c$  of  $\text{Sr}_2\text{CuO}_{(4-x)}$  which is almost a factor of two larger than optimally doped La 214 superconductors has remained a challenge since its discovery by Hiroi et al [1]. Lack of progress is due to the difficulties in synthesis which require a strong oxidizing agent at high pressure and temperature. The resulting superconductor sample is multiphase leading to some ambiguity in interpretation. An unjustified suggestion that the results are spurious is negated by recent experiments in which similar behavior is found but with samples prepared using a different synthesis [2]. This has led us to reconsider the available data in the literature [3]. The experimental value of  $x = \sim 0.6$  suggests that the superconductivity originates in very heavily overdoped  $\text{CuO}_2$  layers containing ordered oxygen vacancies. The data support the idea that there is an exciting region of the cuprate phase diagram waiting to be understood but better samples are needed before the possible pairing mechanisms we can think of, or others yet to be determined, can be investigated.

[1] Z. Hiroi et al., Nature 364 (1993) 315

[2] Q..Q. Liu et al., Phys Rev B 74 (2006) 100506

[3] T.H. Geballe and M. Marezio Physica C 469 (2009) 680

<sup>1</sup>Work done in collaboration with Massimo Marezio.