

## The influence of Re doping on the Hg-1223 superconductors properties

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Samples of the  $Hg_{1-x}Re_xBa_2Ca_2Cu_3O_{8+d}$  superconductor (Hg, Re-1223),  $T_c = 135K$ , with varying rhenium (Re) content ( $x = 0.15, 0.18$  and  $0.25$ ) have been studied since 1998 by resistance under external hydrostatic pressure. The analysis of the results indicated there are different  $dT_c/dP$  behavior ( $2.0K/GPa, 4.8K/GPa$  and  $1.8GPa/K$ ) related for each different Re content ( $x = 0.15, 0.18$  and  $0.20$ ) respectively. It was supposed to be this different  $dT_c/dP$  behavior related with the rhenium oxygen (Re-O) binding distance. In order to understand the Re-O distance influence over the  $dT_c/dP$ , it was measured the EXAFS of the samples. X-ray absorption measurements were performed for Re LIII-edges ( $10,535$  eV), at the XAFS station of National Brazilian Synchrotron Laboratory (LNLS - Brasil - Campinas), on beam line using a Si (111) double-crystal monochromator [19]. The (Hg,Re)-1223 samples with different Re content and a  $ReO_2$  reference sample were ground to fine powder ( $20\mu m$ ) and it were mixing with alcohol. The mixture was vacuum decanted over a special thick ( $0.9mm$ ) paper film and it were mounted on the same sample holder. All spectra were recorded in the transmission mode. The data were analyzed by the reference method with the reference parameter obtained from the  $ReO_2$  reference powder. Data analysis was performed using the WINXAS program. The EXAFS results of the sample with Re  $x = 0.18$  content have shown that there are only two different Re-O distances. On the other hand, the other Re content samples ( $x = 0.15$  and  $0.20$ ) have shown three different Re-O distances. As considering the Re-O coordination in the Re  $x = 0.18$  content, it seems that there is a homogeneous charge transfer from the Hg-O sheet to the Cu-O sheet by using the apical oxygen.

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