

The influence of external pressure on the intrinsic term in Hg,Re-1223 superconductor

E. J. Carvalho, G. Azevedo, F. Garcia,
LNLS

J. L. Rossi, L. G. Martinez
IPEN

M. T. D. Orlando, J. L. Passamai, H. P. S. Correa, C. A. C. Passos, D.O. de Souza, L. Kuplich, J.B. Depianti
UFES

XANES study of Hg,Re-1223 ceramic superconductor was developed using a DAC cell pressure in the DXAS beam line - LNLS. The investigation was focused in the LIII edge from the ReO₆ octahedron. The influence of the external pressure on XANES region is associated with the intrinsic term, which appear on the equation that have been used to described the behavior of the T_c as a function of the external pressure. We have identified changes in the overlap between two Gaussians that it is used to fit the XANES region. These Gaussians are related with the t_{2g} and e_g energy split from the distorted ReO₆ octahedron present in the Hg,Re-1223 superconductor. High pressure conditions associated with the X-Ray techniques can be used to study structural properties of materials are examples of properties that can be affected under high pressure conditions, which characterize it as a powerful tool in the material science[1-5]. The main characteristics of the LNLS's dispersive X-ray absorption (DXAS) beam-line are both the temporal resolution (typically one absorption spectrum can be measured in hundreds of milliseconds) and very small focus [1], which allows materials properties studies under high pressure conditions. The instrumentation available at the DXAS beam-line count with a diamond anvil cell (DAC) specially designed to in situ high pressure experiments. Details of the DAC are shown. This work presents an overview about the firsts attempts of high pressure experiments at the DXAS beam-line using this pressure cells focused on a distortion of the crystalline structure of ReO₃ present in Hg,Re-1223 under high pressure.