conferenceseries.com

J Material Sci Eng 2018, Volume 7
DOI: 10.4172/2169-0022-C4-102

XANES study of the dependence of the hole density on the superconducting properties of Hg (1212) and the Hg oxycarbonate systems

Sumit Kumar Gupta
University of Rajasthan, India

The mercury based superconducting cuprates which represents a fabulous source for the research of new high T_c superconductors have been extensively studied for the past some years just after the discovery of the superconductivity in the mercury cuprate $H_gBa_2CuO_{4+\delta}$. It was realized that the synthesis of the mercury based superconductor is difficult because of its highly metastable character. As a result, the high pressure synthesis was considered to be favorable for the synthesis of these materials. In fact, such metastability may be connected not only with the volatility of the mercury oxide, but also with the dumbbell coordination of Hg(II), that implies a large oxygen deficiency at the level of the mercury layers. The introduction of foreign cations on the mercury sites with higher oxidation state should allow additional oxygen to intercalated and consequently should increase the stability of such structures. The investigation of mixed Hg-M cuprates and copper oxycarbonates, where M is a transition element is based on these considerations. However, despite the above difficulties in their preparation, the Hg-based compounds have received much attention because of their high transition temperature at normal pressure and substantially increase in it with pressure. Substitution of transition elements for the Hg has allowed numerous superconductors for which the T_c depends upon their oxygen stoichiometry and the chemical bonding. Thus the knowledge of their electronic structure is absolutely important for understanding their properties.

sumitguptagit@gmail.com