



Faculty of
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High-pressure research of strongly-correlated electron system

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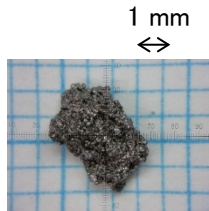


Fig.1 Crystal growth

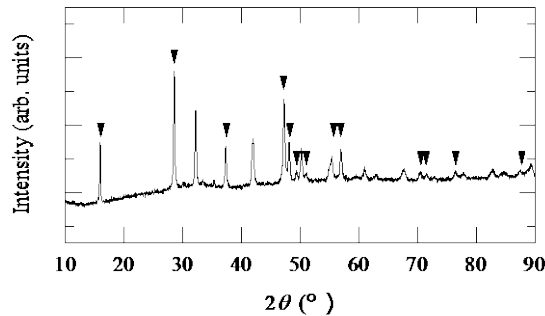


Fig.2 X-ray diffraction pattern

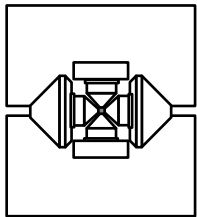


Fig.3 High-Pressure apparatus

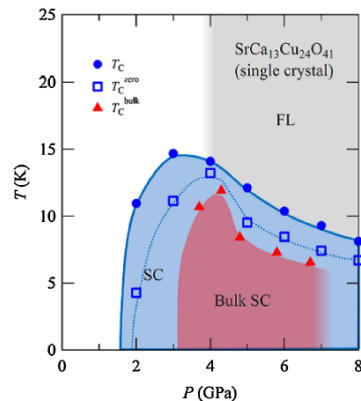
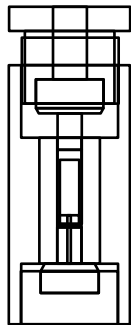


Fig.4 P - T phase diagram for ladder cuprates [1]

Content:

We study strongly-correlated electron system, focusing on the substitution effects and the effects of high pressure. The application of an external pressure causes lattice shrinkage and induces interesting phenomena, such as superconductivity, magnetism and so on. The substitution also induces structural change, which is called as chemical pressure. The doping effects and the effects of structural change can be discriminated by comparing these pressures.

Recently, we performed electrical resistivity and alternating current susceptibility measurements for the two-leg-ladder cuprates. The bulk superconductivity and temperature quadratic behavior of the normal state resistivity were observed above 3.7 GPa. They suggest that a strong interladder interaction induces the bulk superconductivity. Our results also suggested the filamentary superconducting state on the crossover phenomenon. [1]

Keywords:

strongly-correlated electron system, superconductivity, high pressure, NMR

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