Recent experimental results on NbSe₂ and Cd₂Re₂O₇

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The magnetic field dependence of low temperature specific heat on superconducting NbSe₂ was measured and fitted to BCS-like isotropic *s*-wave and two-gap models. It is found that the two-gap model, which has been successfully applied to MgB₂, is better than the BCS-like isotropic *s*-wave for a conventional superconductor in describing the order parameter of superconducting NbSe₂. In this sense, two energy gaps, $_L$ and $_S$ obtained from the best fit of C_{es} data to two-gap model, can quantitatively explain the observed anomalously nonlinear $?(H)\sim H$ (< 1). In addition, an endeavor is underway to search for the correlation between possible structural phase transition and the variation in the electronic structure in Cd₂Re₂O₇. The structure phases were explored by the X-ray diffraction experiments and EXAFS, and both revealed a transition from high temperature cubic to low temperature tetragonal phase. The corresponding changes of the electronic structure inferred from XANES at various temperatures are likely the manifestation of the structural phase transition.

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