

Study of superconductivity in a single crystal of noncentrosymmetric α -BiPd

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Ever since the discovery of the non-centrosymmetric heavy fermion superconductor CePt₃Si [E. Bauer *et al*, Phys. Rev. Lett. **92**, 027003 (2004)], there is widespread research activity to understand the nature of superconductivity in such unconventional superconductors. The term "non-centrosymmetric" characterizes the symmetry of a crystal lattice without inversion center. Study of superconductivity in non-centrosymmetric materials which do not exhibit heavy fermion features is also important since it avoids additional complication that arises due strong f-electron correlations. We report the bulk superconductivity of a high quality sample of monoclinic BiPd (α -BiPd, space group P2₁) below 3.8 K by studying its electrical resistivity, magnetic susceptibility and heat capacity. We establish that it is a clean type-II superconductor with a moderate value of electron-phonon coupling constant and determine its superconducting and normal state parameters. Although α -BiPd is a noncentrosymmetric superconductor with large electronic heat capacity (therefore, large γ), the effect of spin-orbit splitting of the electronic bands at the Fermi level is small. This makes a very small influence on the superconducting properties of α -BiPd.