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Diminishing anisotropy of PrFeAsO_{1-y} single crystal as temperature goes zero¹ DAICHI KUBOTA, TAKEKAZU ISHIDA, Osaka Pref Univ (Sakai), MOTOYUKI ISHIKADO, SHIN-ICHI SHAMOTO, JAEA (Tokai), HIROSHI EISAKI, AIST, HIJIRI KITO, AKIRA IYO, AIST (Tsukuba) — The magnetic torque of a high-quality PrFeAsO_{1-y} single crystal has been investigated at temperatures from 10 K to 45 K in magnetic fields from 5 kG and 50 kG. The torque curves of the PrFeAsO_{1-y} single crystal have been measured systematically. The superconducting anisotropy of PrFeAsO_{1-y} is determined by analyzing the torque curves. The temperature and field dependence of γ reflect that the Fe-oxypnictide superconductivity has the rather three-dimensional isotropic nature of Fe-As layer network. We consider that this is good evidence for the multi-band superconductivity in Fe-oxypnictide. We find that the superconducting anisotropy γ in PrFeAsO_{1-y} can be approximated by $\gamma = 1.08 + 0.0068T$ in all fields by employing the Kogan model. We find it surprising to have such a low anisotropy parameter γ even for a layered superconductor. Such a small anisotropic parameter in Fe-pnictides is preferential to ensure the intergrain connectivity and the resulting high critical current density J_c .

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