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Anisotropic magnetic behavior of single crystalline CeGe
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als Science, Tata Institute of Fundamental Research, Mumbai — We report the
anisotropic magnetic properties of a Czochralski grown single crystal of CeGe, which
crystallizes in the orthorhombic structure with the space group Pnma (#63). The
compound orders antiferromagnetically at $T_N = 10.9$ K, in agreement with the value
reported previously on a polycrystalline sample. A metamagnetic transition at \sim
6.5 T followed by saturation at higher fields is observed along [010], the easy axis of
magnetization. The heat capacity data confirm the bulk nature of magnetic order-
ing with a peak of nearly 13 J/mol K at 10.9 K. The peak decreases in height and
shifts to lower temperatures in applied magnetic field, consistent with the antifer-
romagnetic ordering of Ce ions. Subtraction of phonon heat capacity, as measured
for LaGe, reveals a broad hump around 30 K, suggesting the existence of low lying
crystal electric field levels, which is well reproduced by two doublets located at 45
and 152 K, respectively. The electrical resistivity shows normal metallic behavior
indicating the absence of Kondo interaction. At T_N the resistivity measured along
the three principal directions shows an upturn which is tentatively attributed to the
gaps opened in the antiferromagnetic state. A magnetic phase diagram has been
constructed based on the magnetization data.

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