Crystal growth and magnetic properties of rare-earth (RE) palladium silicides, RE_2PdSi_3

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The rare-earth palladium silicides are known for exhibiting a diverse range of magnetic behaviours dependent on the lanthanide used in the compounds. Recent studies have shown that Gd_2PdSi_3 exhibits a giant topological hall effect and skyrmion-like spin textures driven by magnetic frustration in the compound. Previous studies show Dy_2PdSi_3 has an antiferromagnetic to spin glass transition. Similarly, large magneto-crystalline anisotropy has been reported in Tb_2PdSi_3, Ho_2PdSi_3, Er_2PdSi_3 and Tm_2PdSi_3. Here, we present the results of the single crystal growth of the family of RE_2PdSi_3 (where RE = Gd, Er, Nd, Ho, Ce, Dy, Tb, Eu) by the optical floating zone technique along with a discussion of the structural and magnetic properties of these materials.