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Physical properties of metallic tetragonal compound Ti_4MnBi_2
ABHISHEK PANDEY, MASON KLEMM, HUA HE, MEIGAN C. ARONSON, Texas AM Univ, ARONSON'S GROUP TEAM — We report the investigation of structural, magnetic, thermal and electrical transport properties of metallic compound Ti_4MnBi_2 that crystallizes in a tetragonal structure (space group: $I4/mcm$) with a large $a = 10.4946(4)$ Å and relatively smaller $c = 4.9860(2)$ Å. The structure of this compounds is quite simple where each of the constituent atoms occupy only one atomic site and contains cylindrical channels of Bi and Ti atoms and linear chains of Mn-ions that stretch along the c-axis of the tetragonal unit cell. This metallic compound does not show any evidence of magnetic ordering and exhibits a Curie-Weiss behavior for $T > 30$ K with an antiferromagnetic (AFM) Weiss temperature $\theta_{\rm p} = -13(1)$ K, suggesting the presence of AFM interactions in the material. Heat capacity $C_{\rm p}(T)$ data exhibit a large value of Sommerfeld coefficient $\gamma \approx 200$ mJ/mol K^2 leading to a very large density of states $D(E_{\rm F}) \approx 85$ states/eV f.u. for both spin directions at the Fermi level $E_{\rm F}$. Our investigation of the structure and property relation in this compound will be discussed.

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