A new Mn-Bi-Te ternary antiferromagnetic topological insulator

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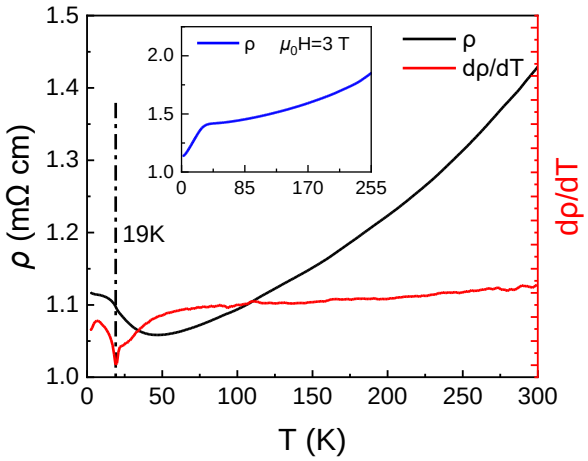
$MnBi_2Te_4$ antiferromagnetic topological has been attracted people's attention owing to its special surface states meanwhile its intrinsic magnetic[1-3]. The gapless surface states of topological material expected to achieve quantum spin hall effect and further to attain lossless energy transport[4]. But the temperature required to achieve quantum anomalous hall effect far below room temperature, due to material limitations, therefore, there is an urgent need to develop new topological insulators. In this work, we successfully growth Mn-Bi-Te ternary antiferromagnetic topological insulator by melting method and characterized using scanning transmission electron microscopy (STEM), Single Crystal X-Ray Diffraction (SXRD), physical property measurement system magnetic (PPMS) and Angle-resolved photoemission spectroscopy (ARPES). Novel Mn-Bi-Te ternary material belong to $R\bar{3}m$ space group, antiferromagnetic transition temperature is around 20K. When the magnetic field rises to 0.5T, a magnetic phase transition occurs which from antiferromagnetic to ferromagnetic. A amount of Bi_{Te} lead to P-type doped, so after evaporating cesium on the surface of the sample, the Fermi level can be seen to shift upwards through ARPES, thus revealing the surface state of the sample.



Pic.1 Resistance versus temperature curve of Mn-Bi-Te

Bibliography
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