

The Magnetic Phase Diagram of CuB₂O₄

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Copper metaborate CuB₂O₄ attracts researcher's concerns due to the particular magnetic structures and other physical properties. CuB₂O₄ was known to have complex magnetic orderings at both $T_1 = 21$ K and $T_2 = 10$ K, especially for the lower temperature one. [1] The nature of both ordering remains not fully elucidated. Very recently, the isotope effect on the electronic structure of CuB₂O₄ has been revealed. [2] Therefore, a deep understanding of CuB₂O₄ is called for to further manipulate the ground state of CuB₂O₄. In this work, we utilize the heat capacity and magnetic measurements to investigate the magnetic orderings at zero and in applied magnetic fields. The preliminary heat capacity data in low fields in Fig. 1 reveal that the ordering at T_2 is of the antiferromagnetic nature. Furthermore, a magnetic crossover below T_2 at zero field has the tendency to have a field-induced long range ordering. More comprehensive results will be presented to have a complete picture of magnetic phase diagram of CuB₂O₄.

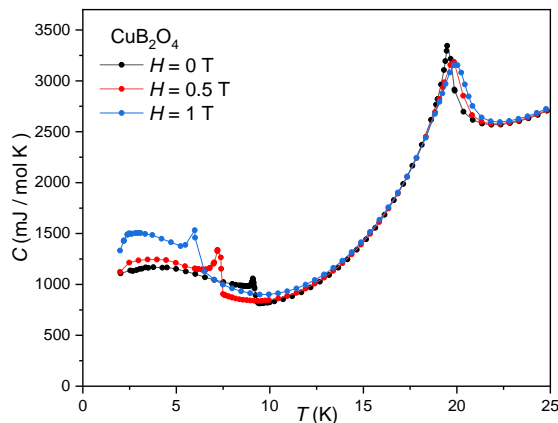


Fig. 1 The heat capacity of CuB₂O₄ at zero field, 0.5 T, and 1 T.

References

[1] M. Boehm et al., Phys. Rev.B **68**, 024405 (2003).

[2] Rea Divina Mero et al., ROYAL SOCIAL OF CHEMISTRY Adv. **10**, 41891–41900 (2020).