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Magnetism of Cobalt Dibromide Dihydrate and Monohydrate¹ G.C. DEFOTIS, A.S. HAMPTON, C.L. DESANTO, C.M. DAVIS, College of William and Mary — The magnetic properties of two hardly studied bromide compounds among the large family of 3d divalent transition metal halide hydrates are examined, with Co(II) the metal ion. Of interest is comparison between magnetic behaviors in the much more common dihydrate form and in the rarely made monohydrate form, as well as comparison between known properties of the far better studied chloride materials and those containing bromide. In the title dihydrate material a magnetic susceptibility maximum appears at 9.5 K, about half the temperature of a similar feature in the chloride dihydrate system. But in the title monohydrate material an enhanced susceptibility maximum appears at 15.5 K, virtually the same as in the similarly behaving chloride monohydrate system. As for chloride systems, a major difference between di- and monohydrates appears in that magnetic irreversibilities are far stronger in the latter. The magnetic susceptibility in both title systems is non-Curie-Weiss like at moderate to high temperatures, but can be accounted for well on the basis of a ground and an excited Kramers doublet, along with exchange interactions. The susceptibility in the vicinity of the maximum in the title dihydrate material is approximately accounted for with a three-dimensional Ising model.

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