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Crystal Growth and High Field Magnetization of the Spin Dimer Compound $Ba_3Cr_2O_8$ ADAM ACZEL, HANNA DABKOWSKA, GRAEME LUKE, McMaster University, Hamilton, ON, Canada, EUN-SANG CHOI, National High Magnetic Field Laboratory, Tallahassee, FL, USA — Spin dimer compounds provide means to access exotic magnetically ordered states. The ground state of these systems is a product of singlets as a result of antiferromagnetic intradimer exchange. However, an applied magnetic field can be used to close the spin gap to excited triplet states, resulting in a state characterized by long range magnetic order at low temperatures. $Ba_3Cr_2O_8$ is an example of a system that shows the behaviour discussed above. To investigate the field-tuned phase transition in this system, we grew single crystals of this material for the first time by the traveling solvent floating zone method. We then proceeded to measure the magnetization of the resulting crystals by the torque magnetometry technique at the National High Magnetic Field Lab. The magnetization is flat until $\sim$ 12.5 T, then shows a rapid, nearly linear increase with field and saturates at $\sim$ 23 T. This behaviour is reminiscent of that seen in the spin dimer compounds $BaCuSi_2O_6$ and $Ba_3Mn_2O_8$ and has been attributed to Bose-Einstein condensation of triplet excitations.

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