

Abstract Submitted  
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**Magnetic excitations from an  $S=1/2$  antiferromagnetic tetramer system  $\text{Cu}_2\text{PO}_4\text{OH}$**  M. MATSUDA, D.L. ABERNATHY, Neutron Scattering Science Division, Oak Ridge National Laboratory, K. TOTSUKA, Yukawa Institute for Theoretical Physics, Kyoto University, Japan, A.A. BELIK, National Institute for Materials Science, Japan —  $\text{Cu}_2\text{PO}_4\text{OH}$  is a candidate material for the  $S=1/2$  diamond-shaped antiferromagnetic tetramer system.<sup>1</sup> The magnetic susceptibility shows a spin-gap behavior and the exchange interaction  $J$  was estimated to be 138 K. Since there have not been so many experimental studies in the spin tetramer systems, it is important to clarify the magnetism in this compound. We have performed inelastic neutron scattering experiments on a powder sample of  $\text{Cu}_2\text{PO}_4\text{OH}$  on a chopper neutron spectrometer ARCS installed at SNS at ORNL in order to study the magnetic excitations from the tetramer spin system. We have clearly observed two magnetic excitations at  $\sim 12$  and  $\sim 20$  meV, whose widths in energy are broader than the instrumental resolution. It was found that the energy levels cannot be explained with the simple antiferromagnetic tetramer model with only nearest-neighbor interaction. We will discuss the results including further-neighbor interactions.

<sup>1</sup>A. A. Belik *et al.*, Inorg. Chem. 46, 8684 (2007).

M. Matsuda  
Neutron Scattering Science Division, Oak Ridge National Laboratory

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