

# A Frustrated Ferrimagnet $\text{Cu}_5(\text{VO}_4)_2(\text{OH})_4$ with 1/5 Magnetization Plateau on a New Spin-Lattice of Alternant Triangular Strip and Honeycomb Strip

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## Supporting Information

**Table S1.** Profile coefficients used for Rietveld refinements of X-ray powder patterns and unit cell parameters and residuals after Rietveld refinements of  $\text{Cu}_5(\text{VO}_4)_2(\text{OH})_4$ .

**Fig. S1.** Simulated and measured XRD powder patterns of  $\text{Cu}_5(\text{VO}_4)_2(\text{OH})_4$ .

**Figure S2.** The EDS analysis of  $\text{Cu}_5(\text{VO}_4)_2(\text{OH})_4$ .

**Figure S3.** IR spectrum of  $\text{Cu}_5(\text{VO}_4)_2(\text{OH})_4$ .

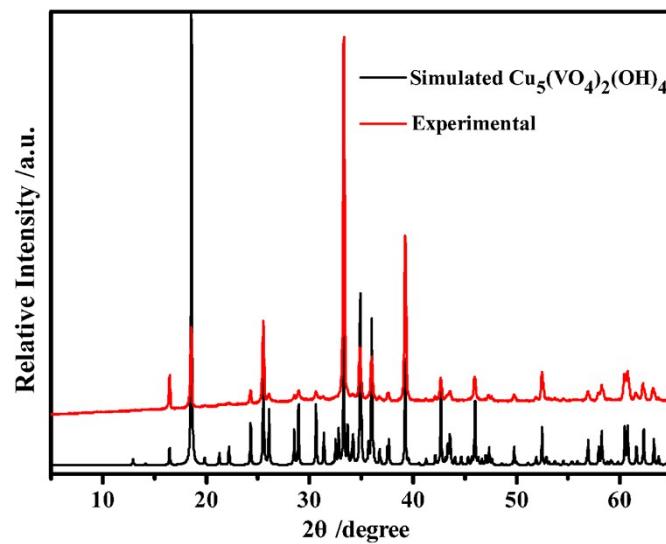
**Figure S4.** TG diagram of  $\text{Cu}_5(\text{VO}_4)_2(\text{OH})_4$ .

**Fig. S5.** The plot of  $d\chi/dT$  showing the magnetic transition.

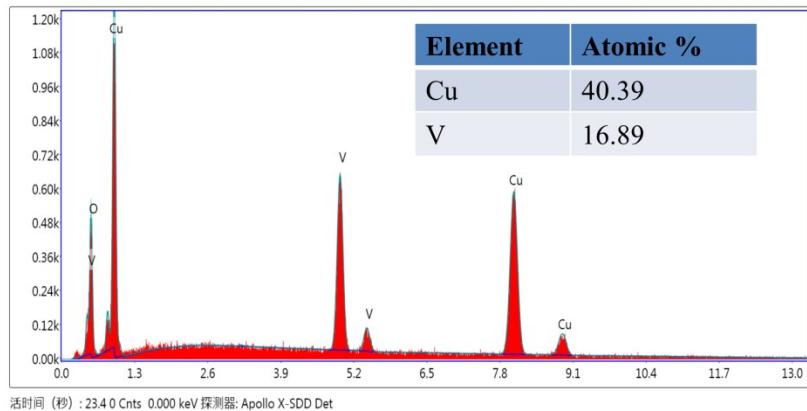
**Figure S6.** In-phase AC magnetization  $\chi'$  versus temperature plot of  $\text{Cu}_5(\text{VO}_4)_2(\text{OH})_4$  and out-of-phase AC magnetization  $\chi''$  versus temperature. The data were collected in a 3 Oe oscillating magnetic field.

**Table S1.** Profile coefficients used for Rietveld refinements of X-ray powder patterns and unit cell parameters and residuals after Rietveld refinements of  $\text{Cu}_5(\text{VO}_4)_2(\text{OH})_4$ .

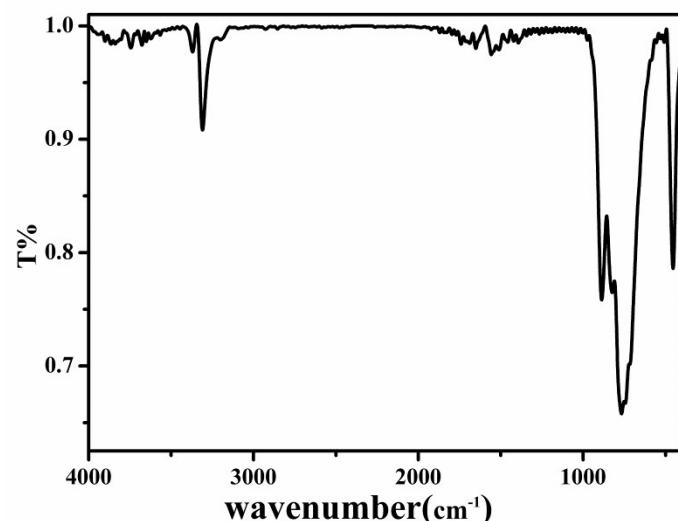
parameter	optimized value
profile coefficients	
peak width parameter	GU = 0; GV = 15.66; GW = 11.31
peak shape parameter	LX = 0; LY = 17.05
peak asymmetry parameter	S/L = 0.029; H/L = 0.029
sample transparency parameter	trns = -3.81
sample displacement parameter	shft = -1.38
MD Pref Orient	(2 0 0); (2 1 1)
unit cell parameter	a = 5.8364; b = 6.2858; c = 6.8528 $\alpha$ = 86.214; $\beta$ = 91.735; $\gamma$ = 92.386
Refinement residuals	$R_p$ = 0.0532; $R_{wp}$ = 0.0732; $\chi^2$ = 2.486



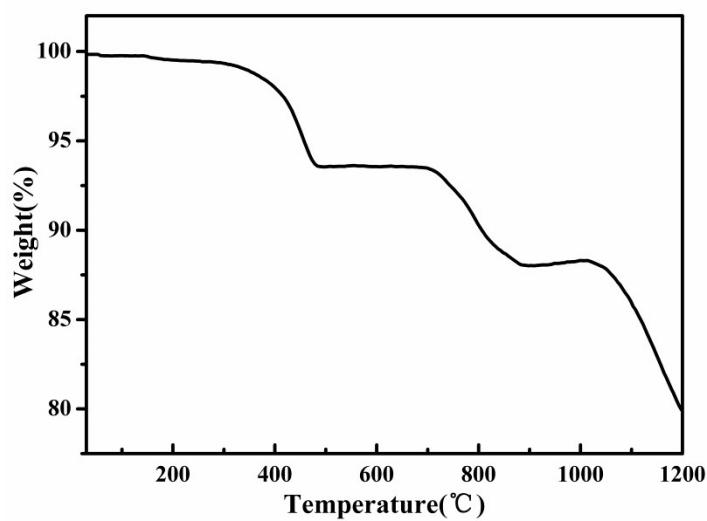
**Fig. S1.** Simulated and measured XRD powder patterns of  $\text{Cu}_5(\text{VO}_4)_2(\text{OH})_4$ .



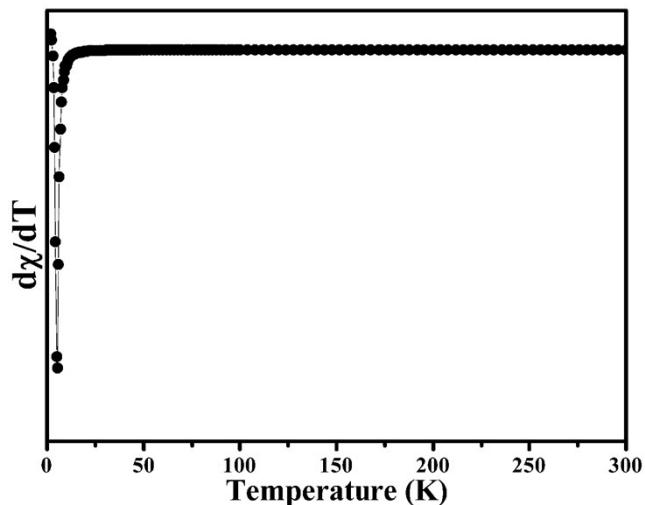
**Figure S2.** The EDS analysis of  $\text{Cu}_5(\text{VO}_4)_2(\text{OH})_4$  confirms the Cu/V/O elemental composition and gives the ration of Cu/V 2.4/1.0.



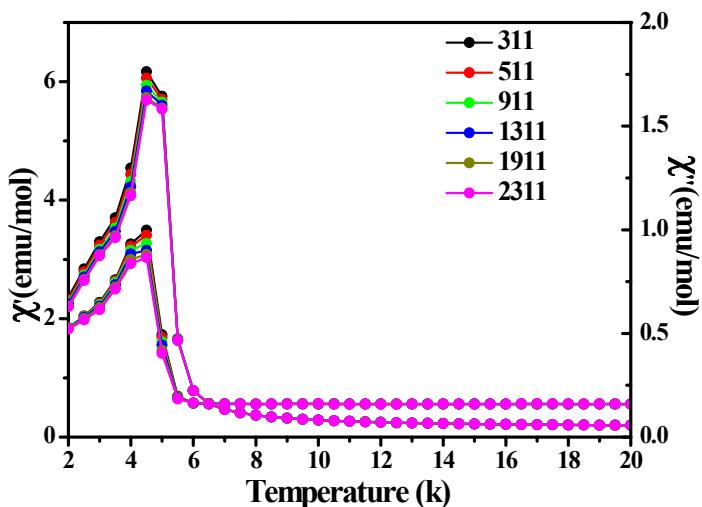
**Figure S3.** IR spectrum of  $\text{Cu}_5(\text{VO}_4)_2(\text{OH})_4$ .



**Figure S4.** TG diagram of  $\text{Cu}_5(\text{VO}_4)_2(\text{OH})_4$ .



**Fig. S5.** The plot of  $d\chi/dT$  showing the magnetic transition.



**Figure S6.** In-phase AC magnetization  $\chi'$  versus temperature plot of  $\text{Cu}_5(\text{VO}_4)_2(\text{OH})_4$  and out-of-phase AC magnetization  $\chi''$  versus temperature. The data were collected in a 3 Oe oscillating magnetic field.