Supporting Information

A New Layered Kagome Strip Structure $Na_2Co_3(AsO_4)_2(OH)_2$: Static and Dynamic Magnetic Properties

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Table SI1. Crystallographic parameters obtained from neutron powder diffraction refinement for $Na_2Co_3(AsO_4)_2(OH)_2$ at 40 K and 1.5 K.

Table SI2. Basis vector for the space group *C*2/*m* (No. 12) with $\boldsymbol{k}$ = (0.5,0.5,0.5). The decomposition for the Co1 is $\Gamma_{mag} = 0\Gamma^1_1 + 3\Gamma^1_2$ and for Co2 is $\Gamma_{mag} = 3\Gamma^1_1 + 3\Gamma^1_2$.

Table SI3. Cristallographic description of the $Na_2Co_3(AsO_4)_2(OH)_2$ magnetic structure at 1.5 K and 0 T, along with basic information on its relationship to the parent paramagnetic structure. All items on the table are supported by the magnetic CIF file, provided as supplementary information.

Table SI1. Crystallographic parameters obtained from neutron powder diffraction refinement for $Na_2Co_3(AsO_4)_2(OH)_2$ at 40 K and 1.5 K.

	40 K, λ = 1.54 Å	1.5 K, λ = 2.41 Å
Space group	*C*2/*m*	*C*2/*m*
R_{wp}	3.16	2.88
a (Å)	14.5855(4)	14.5833(3)
b (Å)	5.9352(2)	5.9380(1)
c (Å)	5.0895(2)	5.0897(2)
β (deg.)	103.47(3)	103.41(2)
V (Å^3)	428.47(2)	428.61(2)
Co1 (2*b*)		
x	0.50000	0.50000
y	1.00000	1.00000
z	1.00000	1.00000
Co2 (4*h*)		
x	0.50000	0.50000
y	0.7391(2)	0.7381(2)
z	0.50000	0.50000

Table SI2. Basis vector for the space group *C*2/*m* (No. 12) with $\boldsymbol{k}$ = (0.5,0.5,0.5). The decomposition for the Co1 is $\Gamma_{mag} = 0\Gamma^1_1 + 3\Gamma^1_2$ and for Co2 is $\Gamma_{mag} = 3\Gamma^1_1 + 3\Gamma^1_2$.

Co1 (0.5, 0, 0)					
IR	BV	Atom	*m*//*a*	*m*//*b*	*m*//*c*
Γ_2	Ψ_1	1	1	0	0
	Ψ_2	1	0	1	0
	Ψ_3	1	0	0	1
Co2_1: (0.5, 0.735, 0.5), Co2_2:(0.5, 0.265, 0.5),					
IR	BV	Atom	*m*//*a*	*m*//*b*	*m*//*c*
Γ_1	Ψ_1	1	1	0	0
		2	-1	0	0
	Ψ_2	1	0	1	0
		2	0	-1	0
	Ψ_3	1	0	0	-1
		2	0	0	-1
Γ_2	Ψ_1	1	1	0	0
		2	1	0	0
	Ψ_2	1	0	1	0
		2	0	1	0
	Ψ_3	1	0	0	1
		2	0	0	1

Table SI3. Cristallographic description of the $Na_2Co_3(AsO_4)_2(OH)_2$ magnetic structure at 1.5 K and 0 T, along with basic information on its relationship to the parent paramagnetic structure. All items on the table are supported by the magnetic CIF file, provided as supplementary information.

Compound	$Na_2Co_3(AsO_4)_2(OH)_2$
Parent space group	*C2/m* (No. 12)
Propagation vector(s)	(½, ½, ½)
Transformation from parent basis to the one used	(2***a***,2***b***,2***c***;0,0,0)
MSG symbol	P_s-1
MSG number	*2.7*
Transformation from basis used to standard setting of MSG	(¼***a***+¼***b***+½***c***, -¼***a***+¼***b***, ***c***;1/8, 1/8, 0)
Magnetic point group	*-11' (No. 2.2.4)*
Unit cell parameters	*a=29.167* *b=11.876* *c=10.179* *β =103.47º*
MSG symmetry operations	*x,y,z,+1* *-x,-y,-z,-1*
MSG symmetry centering operations	*x,y,z,+1* *x+1/4,y+3/4,z,+1* *x+1/4,y+1/4,z+1/2,+1* *x+1/2,y+1/2,z,+1* *x,y+1/2,z+1/2,+1* *x+1/2,y,z+1/2,+1* *x+3/4,y+1/4,z,+1* *x+3/4,y+3/4,z+1/2,+1* *x,y,z+1/2,-1* *x+1/2,y,z,-1* *x+1/4,y+1/4,z,-1* *x,y+1/2,z,-1* *x+1/2,y+1/2,z+1/2,-1* *x+3/4,y+3/4,z,-1* *x+3/4,y+1/4,z+1/2,-1* *x+1/4,y+3/4,z+1/2,-1*
Positions of magnetic atoms	*Co1 0.00000 0.25000 0.00000* *Co2 0.00000 0.11600 0.25000*
Positions of non-magnetic atoms	*As 0.43660 0.00000 0.45600* *Na 0.13620 0.00000 0.35285* *O1 0.28445 0.00000 0.35050* *H 0.31735 0.00000 0.36950* *O2 0.45305 0.00000 0.11975* *O3_1 0.20675 0.13085 0.39175* *O3_2 0.79325 0.13085 0.60825* *O4 0.37805 0.00000 0.40620*

Magnetic moments components (μ_B) of magnetic atoms, symmetry constraints and total moment magnitudes	*Co1 2.51(2), -0.27(1), -3.01(1)* (m_a,m_b,m_c) 4.3(1) μ_B *Co2 0.51(1), 2.83(7), 0.16(1)* (m_a,m_b,m_c) *2.87 (7)* μ_B