

Supporting Information

S1 - X-ray diffraction data for Polycrystalline $\text{Co}_4\text{Fe}_{3.33}(\text{VO}_4)_6$ S2 - X-ray diffraction data for Polycrystalline $\text{Mn}_3\text{Fe}_4(\text{VO}_4)_6$ X-ray diffraction data for Polycrystalline $\text{Co}_4\text{Fe}_{3.33}(\text{VO}_4)_6$

<i>h k l</i>	$d_{\text{hkl-obs}}$	$d_{\text{hkl-cal}}^a$	I/I_0	<i>h k l</i>	$d_{\text{hkl-obs}}$	$d_{\text{hkl-cal}}^a$	I/I_0
0 1 1	8.7337	8.7783	9	1 0 7	2.1970	2.2008	4
0 0 2	8.5649	8.5943	7	1 4 4	2.0070	2.0071	8
0 2 0	5.0867	5.1051	4	1 0 8	1.9718	1.9717	3
0 2 2	4.3861	4.3892	36	2 3 2	1.9526	1.9527	4
1 0 2	4.2978	4.2979	28	2 3 3	1.8924	1.8926	13
0 3 1	3.3373	3.3386	24	2 0 6	1.8762	1.8757	8
1 2 2	3.2866	3.2879	100	1 5 3	1.7925	1.7935	6
1 0 4	3.2513	3.2487	55	2 4 0	1.7795	1.7793	10
0 3 3	2.9267	2.9261	25	2 2 6	1.7607	1.7606	7
0 0 6	2.8644	2.8648	18	1 1 9	1.7559	1.7559	7
1 3 1	2.7702	2.7701	25	2 0 7	1.7432	1.7454	3
1 2 4	2.7413	2.7408	23	2 3 5	1.7321	1.7320	3
1 1 5	2.7234	2.7236	18	2 1 7	1.7197	1.7205	3
0 4 0	2.5532	2.5526	9	0 6 0	1.7020	1.7017	11
1 3 3	2.5205	2.5206	45	0 3 9	1.6657	1.6655	21
0 2 6	2.4988	2.4983	15	1 5 5	1.6549	1.6551	5
2 0 0	2.4814	2.4815	37	2 4 4	1.6437	1.6439	3
0 4 2	2.4461	2.4469	3	3 1 1	1.6253	1.6257	6
1 1 6	2.4138	2.4109	12	1 6 2	1.5824	1.5822	25
2 1 1	2.3890	2.3879	7	2 5 1	1.5706	1.5702	13
1 4 1	2.2511	2.2504	8	1 2 10	1.5479	1.5478	20

^a $a = 4.963(1)\text{\AA}$, $b = 10.210(1)\text{\AA}$, $c = 17.189(2)\text{\AA}$, $\lambda = 1.54056\text{\AA}$.

X-ray diffraction data for polycrystalline $\text{Mn}_3\text{Fe}_4(\text{VO}_4)_6$

<i>h k l</i>	$d_{\text{hkl}}\text{-obs}$	$d_{\text{hkl}}\text{-cal}^{\text{a}}$	I/I_0	<i>h k l</i>	$d_{\text{hkl}}\text{-obs}$	$d_{\text{hkl}}\text{-cal}^{\text{a}}$	I/I_0
0 1 0	7.4495	7.4559	11	2 -2 1	2.6551	2.6580	5
0 1 -1	7.0195	7.0263	10	2 0 1	2.6361	2.6358	4
1 0 0	6.1501	6.1473	3	0 3 -2	2.5830	2.5818	26
1 -1 -1	4.8997	4.9006	9	0 3 0	2.4860	2.4853	3
1 -1 1	4.6597	4.6604	6	2 -1 -3	2.4480	2.4457	8
0 1 -2	4.5600	4.5641	2	1 0 3	2.3618	2.3626	5
0 0 2	4.4293	4.4296	2	0 3 -3	2.3405	2.3421	2
1 1 -2	4.0010	4.0010	1	0 2 -4	2.2828	2.2821	2
0 2 -1	3.9605	3.9606	4	2 1 1	2.2425	2.2411	3
0 2 0	3.7309	3.7280	14	0 3 1	2.2021	2.2029	11
0 2 -2	3.5105	3.5131	4	2 1 -4	2.1756	2.1765	4
1 -1 2	3.4024	3.4008	5	3 -2 -1	2.1068	2.1050	2
2 0 -1	3.2723	3.2749	13	1 -3 -2	2.0540	2.0551	4
2 -1 -1	3.2361	3.2444	5	0 1 4	1.9490	1.9472	6
2 -1 0	3.2098	3.2085	10	0 4 -3	1.9013	1.9007	1
0 1 -3	3.1444	3.1429	32	1 -4 3	1.8643	1.8638	5
1 0 2	3.1164	3.1193	9	2 3 -1	1.8148	1.8142	2
0 2 1	3.0764	3.0767	100	1 -2 -4	1.7991	1.7999	2
1 2 -2	3.0294	3.0311	3	1 4 -1	1.7521	1.7518	4
2 -1 -2	2.9080	2.9068	4	3 -3 2	1.7049	1.7048	11
2 -2 0	2.8351	2.8352	4	2 3 0	1.6949	1.6955	4
2 1 -1	2.7997	2.8010	5	4 -1 -1	1.6662	1.6655	5
2 1 -2	2.7718	2.7750	5	1 -3 5	1.6367	1.6371	11
1 2 -3	2.6860	2.6830	7				

^a $a = 6.702(2)\text{\AA}$, $b = 8.131(2)\text{\AA}$, $c = 9.800(3)\text{\AA}$,
 $\alpha = 105.60(2)^\circ$, $\beta = 105.54(2)^\circ$, $\gamma = 102.23(2)^\circ$, $\lambda = 1.54056\text{\AA}$.