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Supporting Information

Mixed Valent Antimony Induced Disorder in Substituted Antiferromagnetic Mn_2SnS_4

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Table S1: Weight of the elements used for synthesis of Sb substituted Mn_2SnS_4 compounds.

Sb content (%)	Weight of the elements			
	Weight of Mn (g)	Weight of Sn (g)	Weight of Sb (g)	Weight of S (g)
5	0.0913	0.0937	0.0051	0.1098
10	0.0912	0.0888	0.0101	0.1098
15	0.0913	0.0838	0.0152	0.1097
20	0.0913	0.0789	0.0202	0.1097

Table S2. FESEM-EDX composition of Sb substituted Mn_2SnS_4 compounds.

Loaded Composition	**Atom %**				**EDX Composition**
	Mn	**Sn**	**Sb**	**S**	
$Mn_2Sn_{0.95}Sb_{0.05}S_4$	31.15	14.10	0.62	54.13	$Mn_{2.0}Sn_{0.91}Sb_{0.04}S_{3.48}$
$Mn_2Sn_{0.90}Sb_{0.10}S_4$	29.25	13.48	1.79	55.48	$Mn_{2.0}Sn_{0.92}Sb_{0.12}S_{3.79}$
$Mn_2Sn_{0.85}Sb_{0.15}S_4$	29.52	12.16	2.93	55.39	$Mn_{2.0}Sn_{0.82}Sb_{0.19}S_{3.75}$

Table S3. The refined lattice parameters of Sb substituted Mn_2SnS_4 obtained from PXRD.

Sb content	**5%**	**10%**	**15%**	**20%**
a (Å)	7.4122(9)	7.4136(9)	7.4138(8)	7.4129(10)
b (Å)	10.475(1)	10.477(1)	10.476(1)	10.4766(6)
c (Å)	3.6650(5)	3.6666(4)	3.6670(4)	3.6659(2)
χ^2	1.41	1.54	1.61	1.40
Rp (%)	8.64	9.31	9.82	8.72
Rwp (%)	10.4	10.9	11.2	10.6

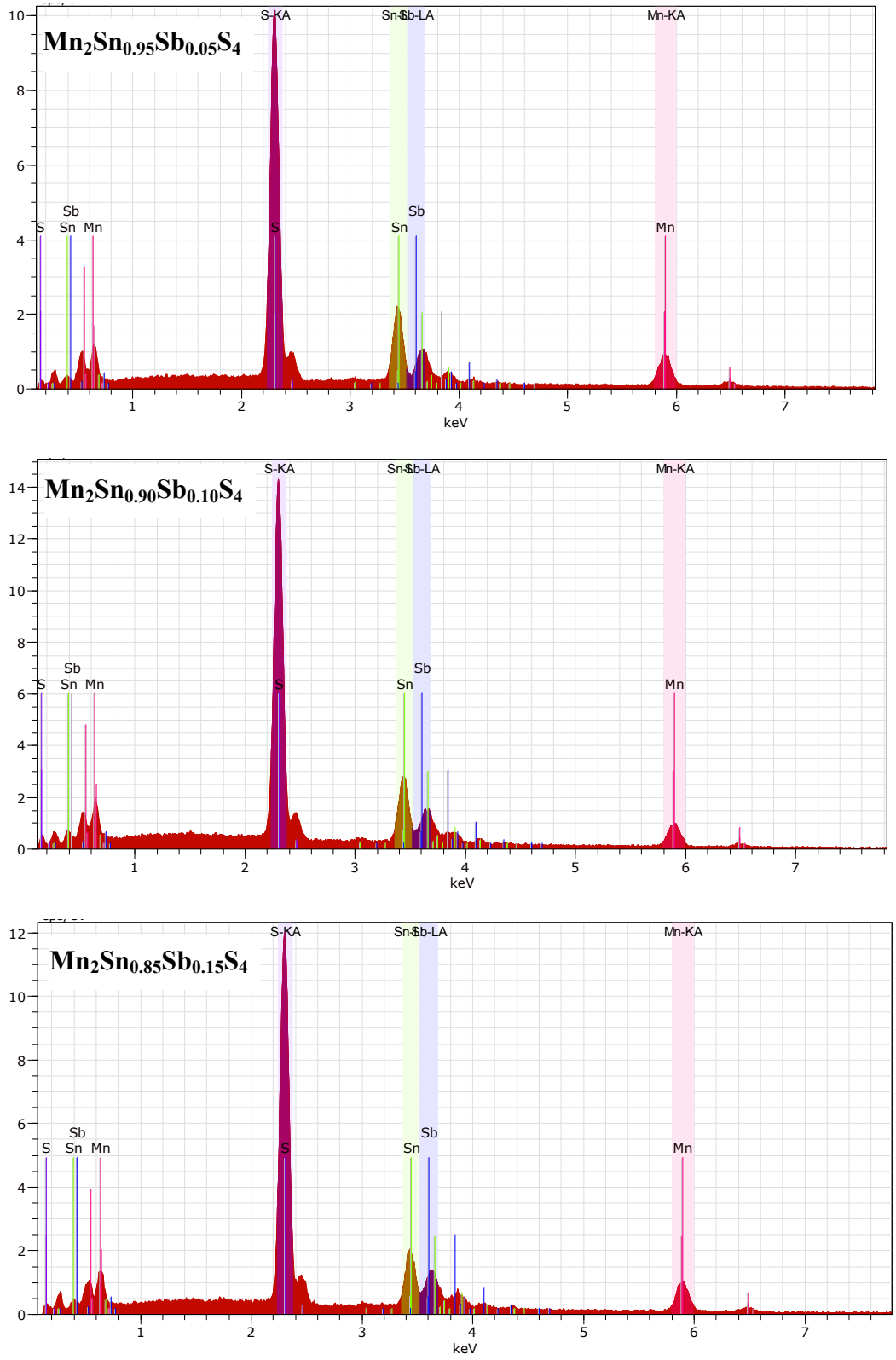

Figure S1. FESEM-EDX spectra of Sb substituted Mn_2SnS_4 compounds.

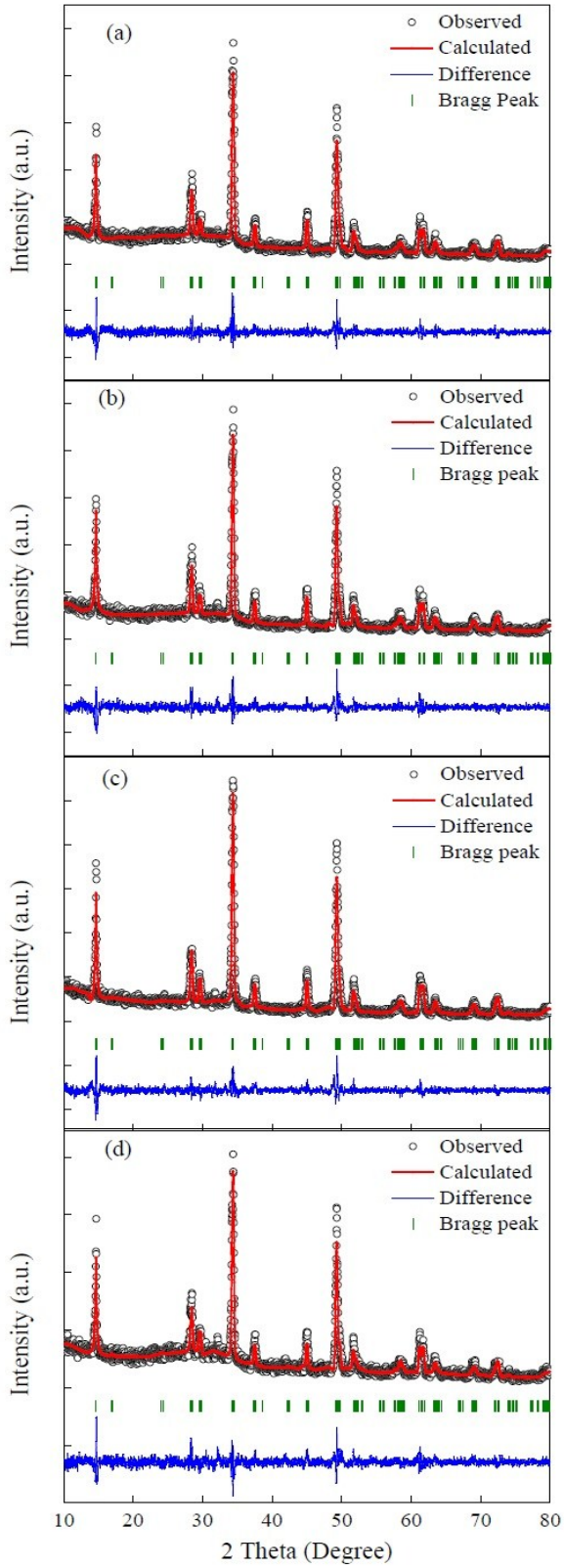

Figure S2. Rietveld refinement of PXRD data of (a) $Mn_2Sn_{0.95}Sb_{0.05}S_4$, (b) $Mn_2Sn_{0.90}Sb_{0.10}S_4$, (c) $Mn_2Sn_{0.85}Sb_{0.15}S_4$, (d) $Mn_2Sn_{0.80}Sb_{0.20}S_4$.

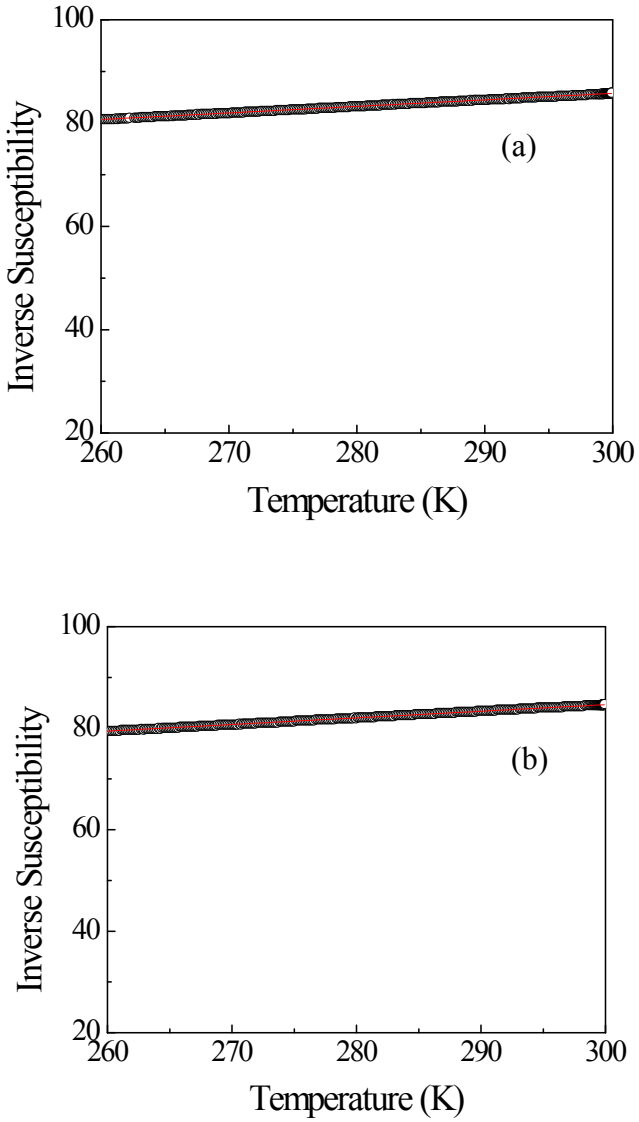

Figure S3. Fitted inverse susceptibility vs temperature plot of (a) $Mn_2Sn_{0.95}Sb_{0.05}S_4$ and (b) $Mn_2Sn_{0.80}Sb_{0.20}S_4$.

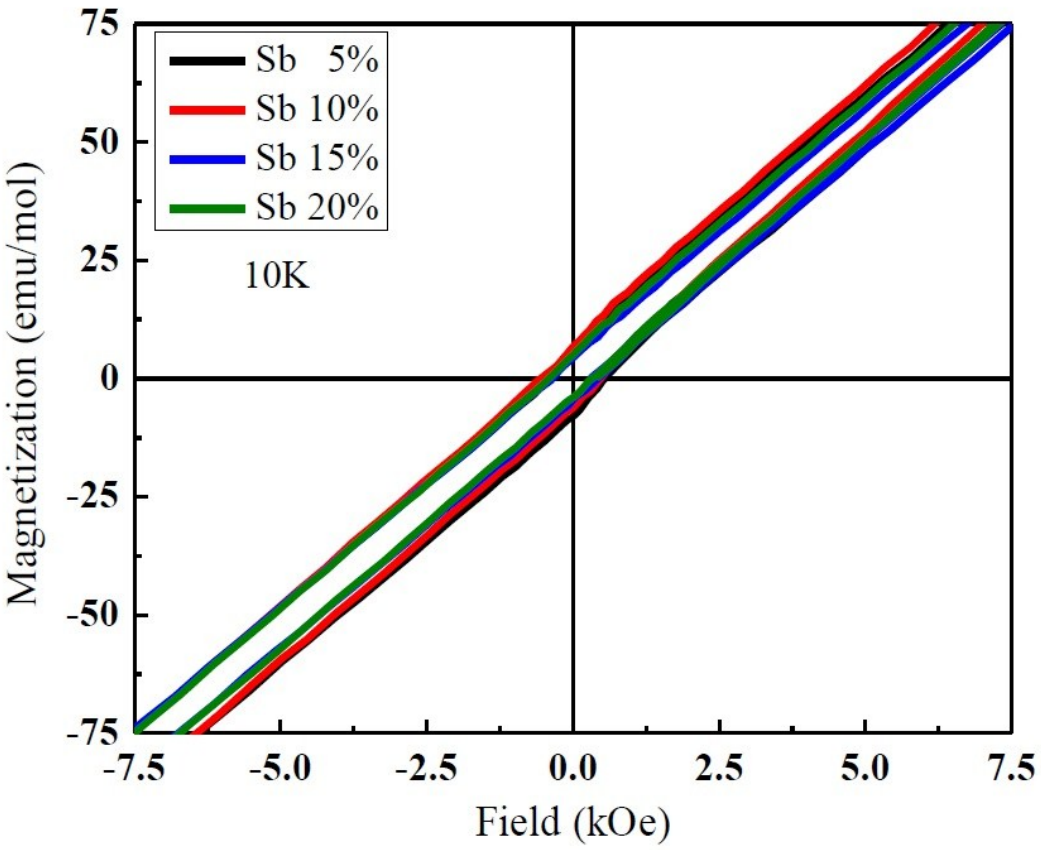

Figure S4. Hysteresis loop at magnetization vs field plot at 10 K of Sb substituted Mn_2SnS_4 compounds.