Supplementary Information

Carrier-filtering and phonon-blocking $AgSnSe_2$-decorated grain boundaries to boost thermoelectric performance of $Cu_2Sn_{0.9}Co_{0.1}S_3$

Table S1. Lattice parameters and the phase fraction for $Cu_2Sn_{0.9}Co_{0.1}S_3$-$x$$AgSnSe_2$ (x = 0, 1 wt.%, 2 wt.%, 3 wt.% and 4 wt.%) obtained from Rietveld refinement of XRD with low R_{wp} indexes.

x	Phase content (wt.)	Lattice constants (Å)			R_{wp} (%)
		a	b	c	
0	*Cc* (4.24%)	6.69	11.51	6.69	4.09
	*F*3*m* (30%)	5.427	5.427	5.427	
	*I*2*m* (65.76%)	5.426	5.426	10.867	
1 wt.%	*Cc* (5.08%)	6.719	11.652	6.731	5.00
	*F*3*m* (31%)	5.428	5.428	5.428	
	*I*2*m* (64%)	5.430	5.430	10.861	
2 wt.%	*Cc* (5.67%)	6.68	11.652	6.68	4.87
	*F*3*m* (32.9%)	5.430	5.430	5.430	
	*I*2*m* (61.5%)	5.430	5.430	10.861	
3 wt.%	*Cc* (4.69%)	6.721	11.45	6.731	4.45
	*F*3*m* (31.3%)	5.431	5.431	5.431	
	*I*2*m* (64%)	5.429	5.429	10.868	
4 wt.%	*Cc* (8%)	6.67	11.53	6.67	4.38
	*F*3*m* (34%)	5.437	5.437	5.437	
	*I*2*m* (58%)	5.427	5.427	10.871	

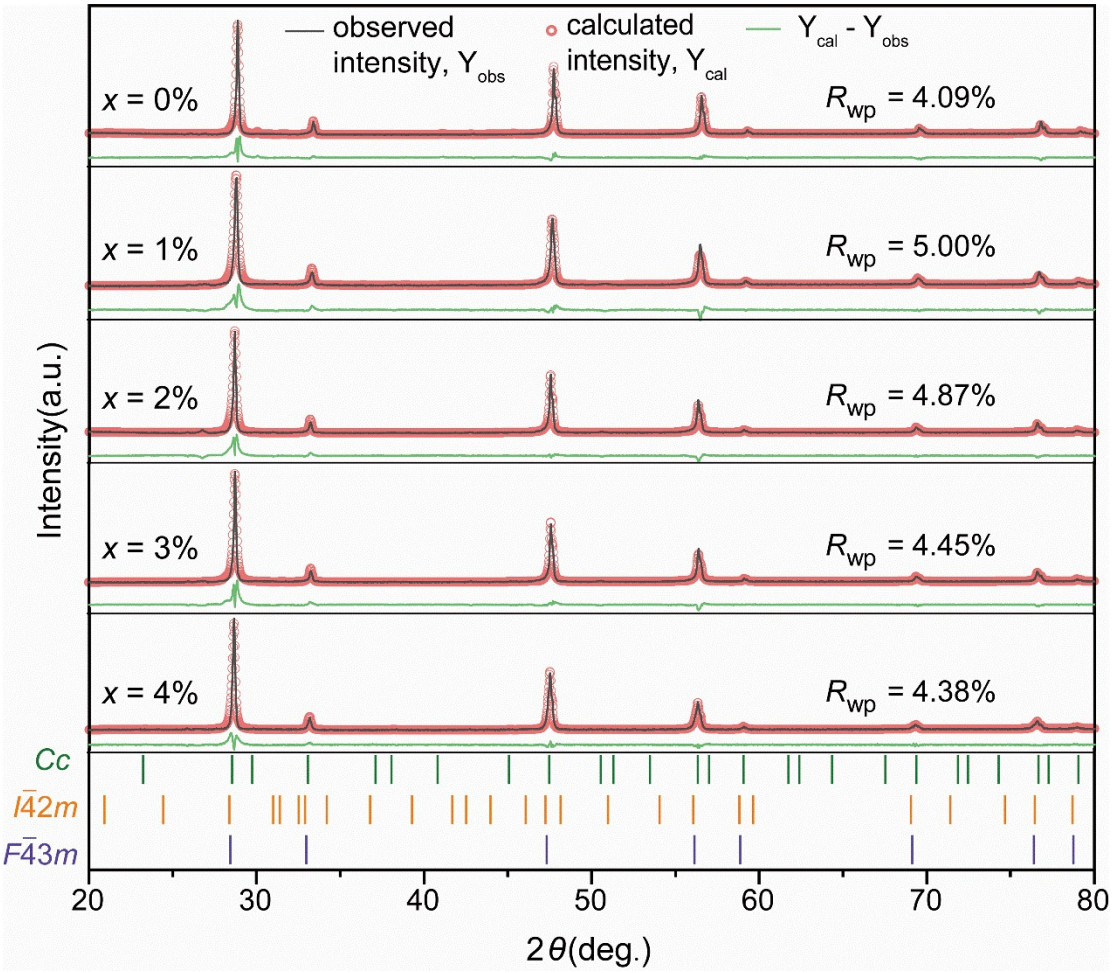

Figure S1. Rietveld refinement results for $Cu_2Sn_{0.9}Co_{0.1}S_3$-xAgSnSe$_2$ (x = 0, 1 wt.%, 2 wt.%, 3 wt.% and 4 wt.%) using the software Profex, which deduce the weight percentage of the monoclinic, cubic and tetragonal phases of CTS.