

Supplementary information

Solvent composition regulates the Se: Sb ratio in antimony selenide nanowires
deposited from thiol–amine solvent mixtures

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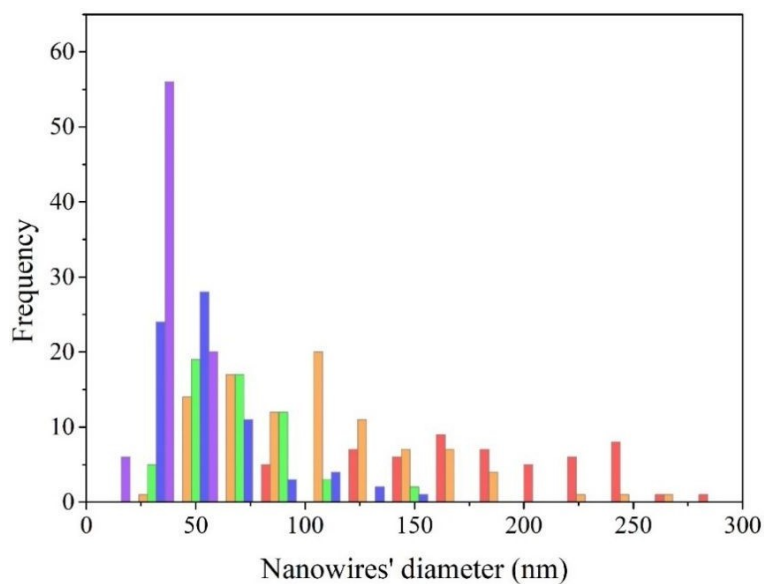


Figure S1. Histogram of antimony selenide nanowires prepared from different en: EDT ratios I.e., post-dissolution en dilution series (Red, orange, green, blue and purple bars indicate AP, 1:1, 1:4, 1:5 and 1:10, respectively).

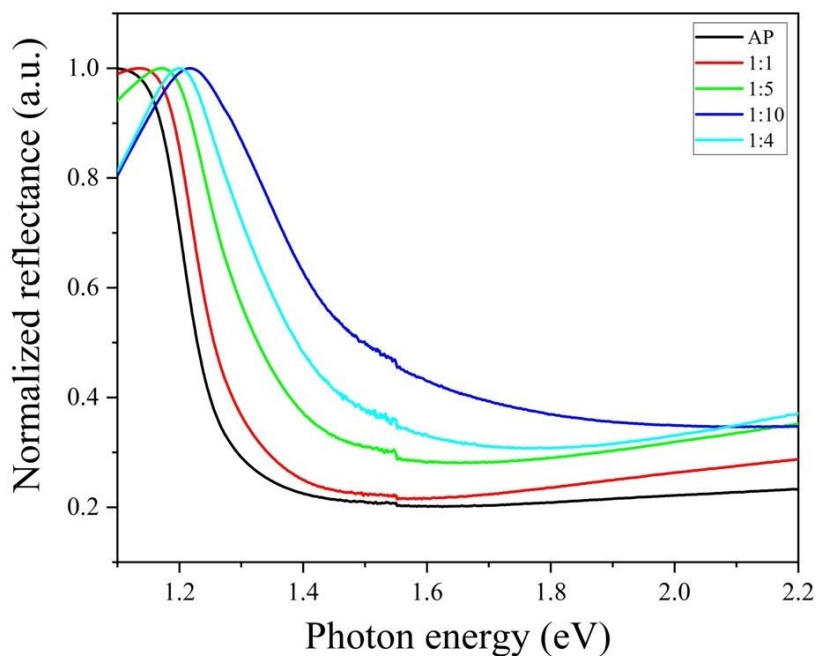


Figure S2. Diffuse reflectance spectra of antimony selenide NWs deposited from solutions having same en: EDT ratios, but different metal organic complex concentrations (*Sb-Se post-dissolution en:EDT dilution series*)

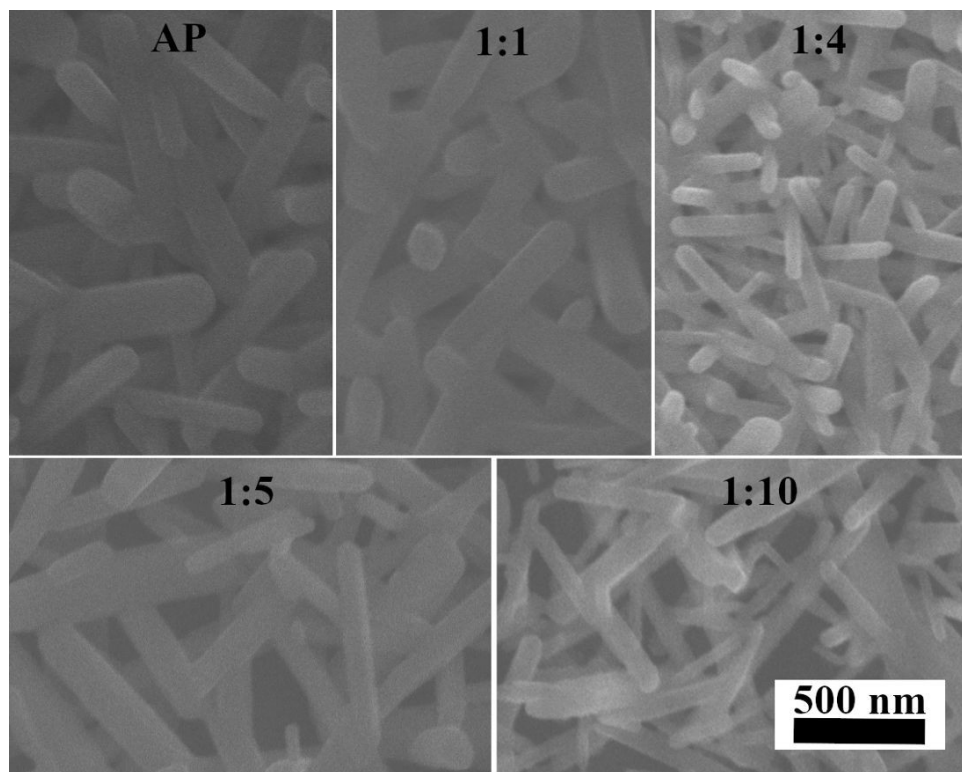


Figure S3. SEM images of antimony selenide NWs deposited from ‘*post-dissolution en:EDT dilution series*’.

Table S1. Post-dissolution en:EDT dilution series: Se/Sb elemental ratio and NWs’ diameter.

<i>Sample</i>	<i>Se/ Sb atomic ratio</i>	<i>Diameter (nm)</i>
<i>AP</i>	1.41 ± 0.02	100 ± 30
<i>1:1</i>	1.45 ± 0.04	108 ± 29
<i>1:5</i>	1.29 ± 0.04	81 ± 21
<i>1:10</i>	1.22 ± 0.05	57 ± 16
<i>1:4*</i>	1.35 ± 0.07	55 ± 17

*This solution got solidified after dilution with en-EDT solvent mixture.

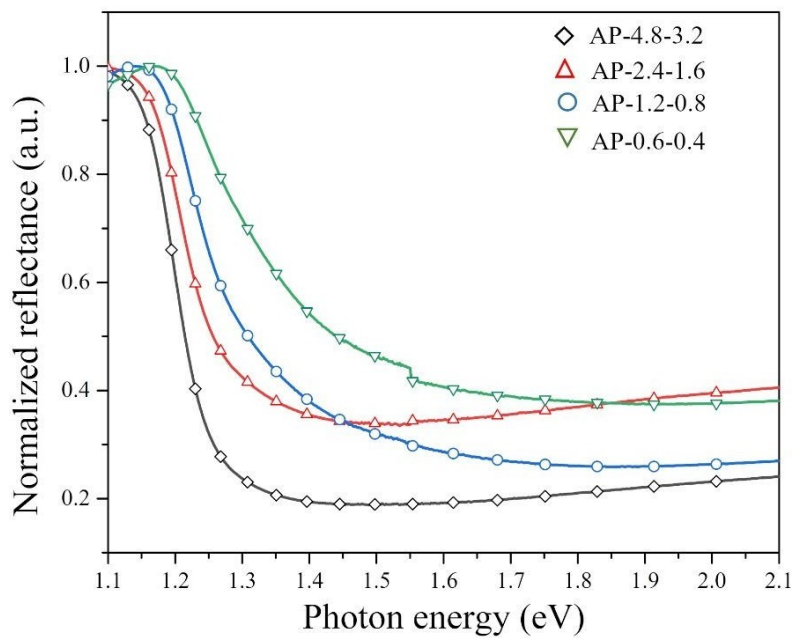


Figure S4. Diffuse reflectance spectra of antimony selenide NWs deposited from solutions having same en: EDT molar ratios (*pre-dissolution en:EDT dilution series*; en: EDT ratio was 4:1 (v/v) in all samples; numbers designate Se-Sb at%).

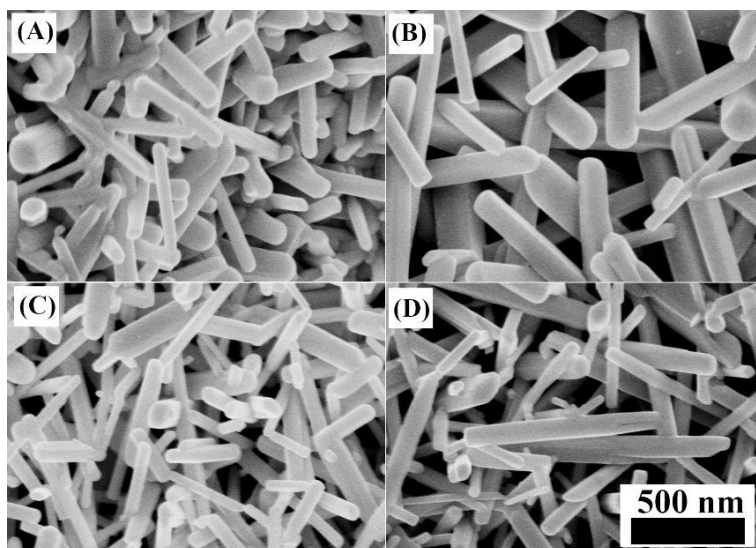


Figure S5. SEM images of antimony selenide NWs deposited from ‘*pre-dissolution en:EDT dilution series*’ (A) AP-4.8-3.2 (B) AP-2.4-1.6 (C) AP-1.2-0.8 and (D) AP-0.6-0.4.

Table S2. Pre-dissolution en:EDT dilution series: Experimental details, band gap, NWs diameter and Se/Sb elemental ratio.

<i>Sample</i>	<i>Se</i> (mmol)	<i>Sb</i> (mmol)	<i>en</i> (mL)	<i>EDT</i> (mL)	<i>Band gap</i> (eV)	<i>Average diameter</i> (nm)	<i>Se/Sb ratio</i> (atomic) by <i>SEM-EDS</i>
<i>AP-4.8-3.2</i>	4.8	3.2	1.6	0.4	1.16	115 ± 41	1.42 ± 0.03
<i>AP-2.4-1.6</i>	2.4	1.6	1.6	0.4	1.17	136 ± 53	1.30 ± 0.02
<i>AP-1.2-0.8</i>	1.2	0.8	1.6	0.4	1.19	100 ± 41	1.29 ± 0.02
<i>AP-0.6-0.4</i>	0.6	0.4	1.6	0.4	1.22	89 ± 40	1.35 ± 0.01

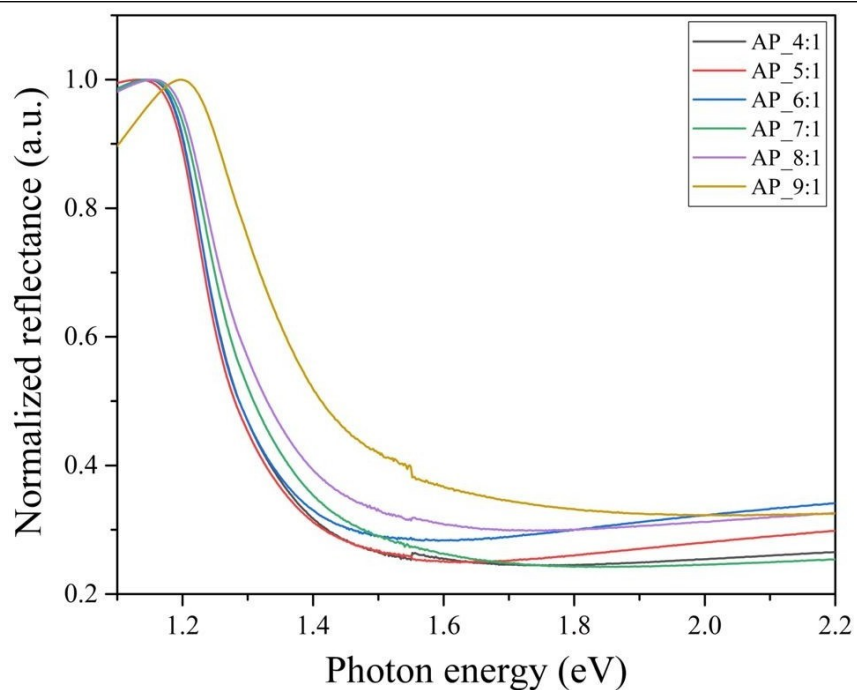


Figure S6. Diffuse reflectance spectra of antimony selenide NWs deposited from ‘pre-dissolution en dilution series’. 4:1, 5:1, 6:1, 7:1, 8:1 and 9:1 are the en: EDT volume ratios that have been used.

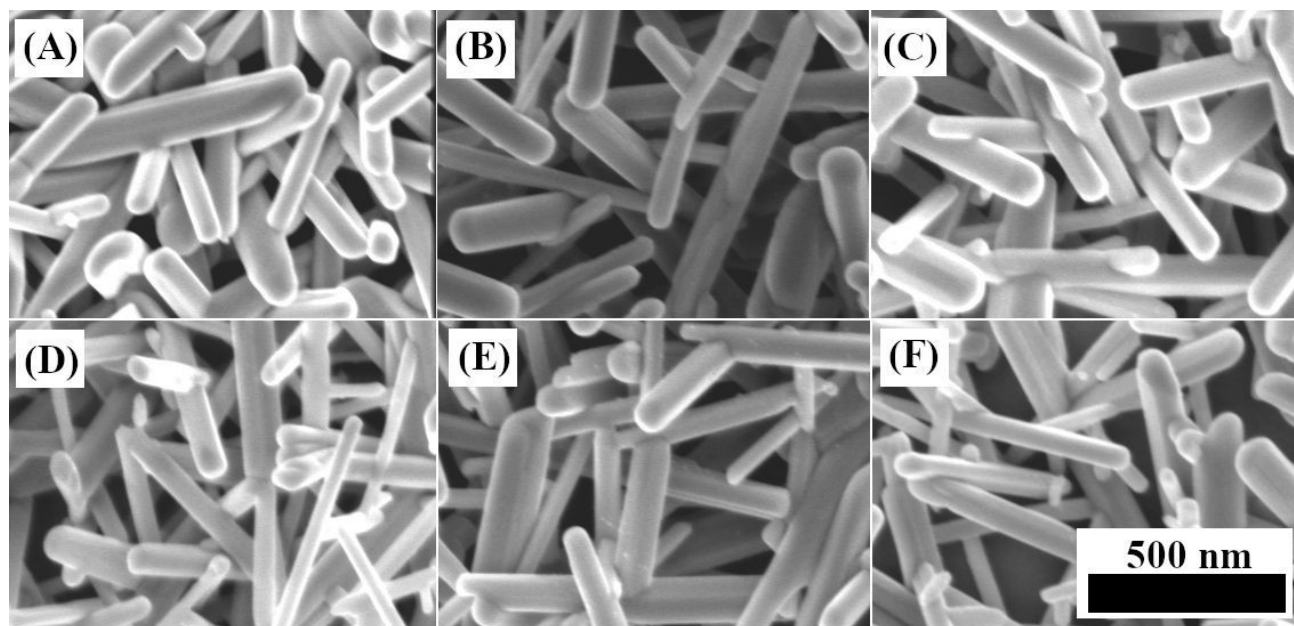


Figure S7. SEM images of antimony selenide NWs deposited from ‘*pre-dissolution en dilution series* (A) AP-4:1 (B) AP-5:1 (C) AP-6:1 (D) AP-7:1 (E) AP-8:1 and (F) AP-9:1.

Table S3. Pre-dissolution en dilution series: Experimental details, NWs diameter and Se/Sb elemental ratio.

<i>Sample</i>	<i>Se</i> (<i>mmol</i>)	<i>Sb</i> (<i>mmol</i>)	<i>en</i> (<i>mL</i>)	<i>EDT</i> (<i>mL</i>)	<i>Average</i> <i>diameter</i> (<i>nm</i>)	<i>Se/Sb atomic</i> <i>ratio by SEM-</i> <i>EDS</i>
<i>AP-4:1</i>	4.8	3.2	1.6	0.4	125 ± 40	1.40 ± 0.05
<i>AP-5:1</i>	4.8	3.2	2.0	0.4	128 ± 35	1.44 ± 0.09
<i>AP-6:1</i>	4.8	3.2	2.4	0.4	96 ± 34	1.45 ± 0.08
<i>AP-7:1</i>	4.8	3.2	2.8	0.4	76 ± 27	1.30 ± 0.07
<i>AP-8:1</i>	4.8	3.2	3.2	0.4	108 ± 38	1.36 ± 0.13
<i>AP-9:1</i>	4.8	3.2	3.6	0.4	70 ± 32	1.26 ± 0.08

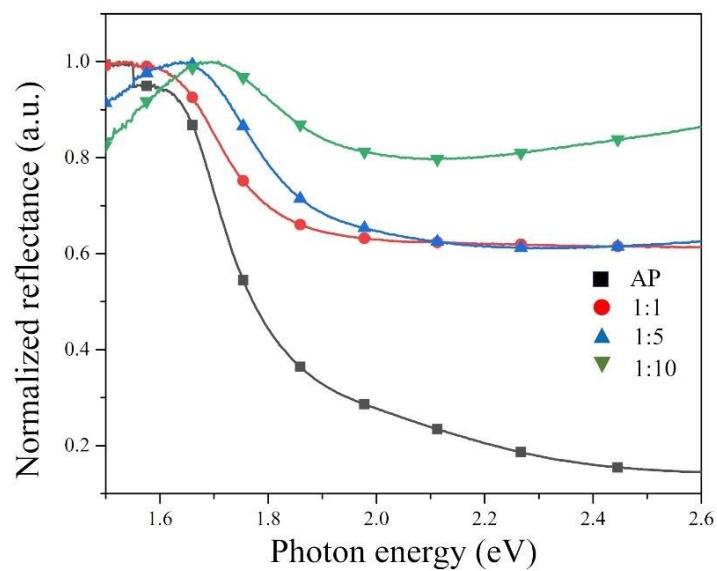


Figure S8. Diffused reflectance spectroscopy of Sb_2S_3 nanowires deposited from en: EDT solvent mixture.

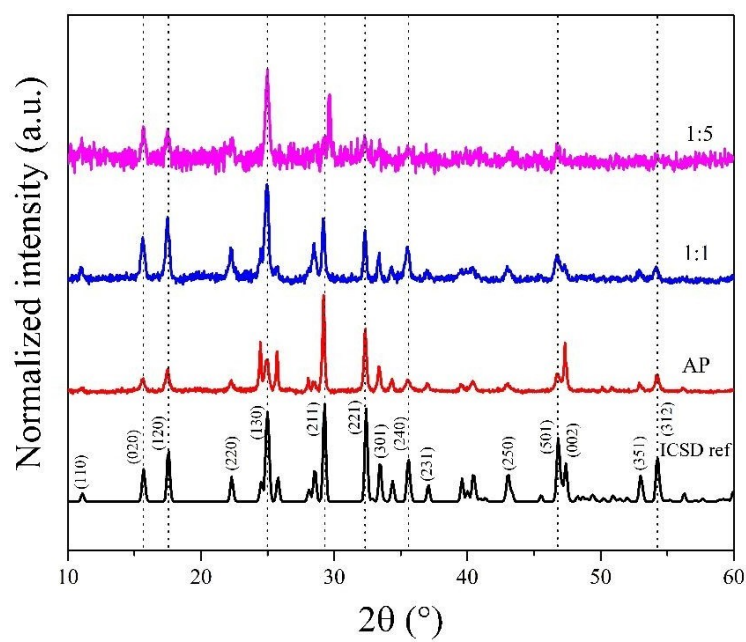


Figure S9. X-Ray Diffraction pattern of Sb_2S_3 nanowires deposited from different en: EDT solvent mixture.

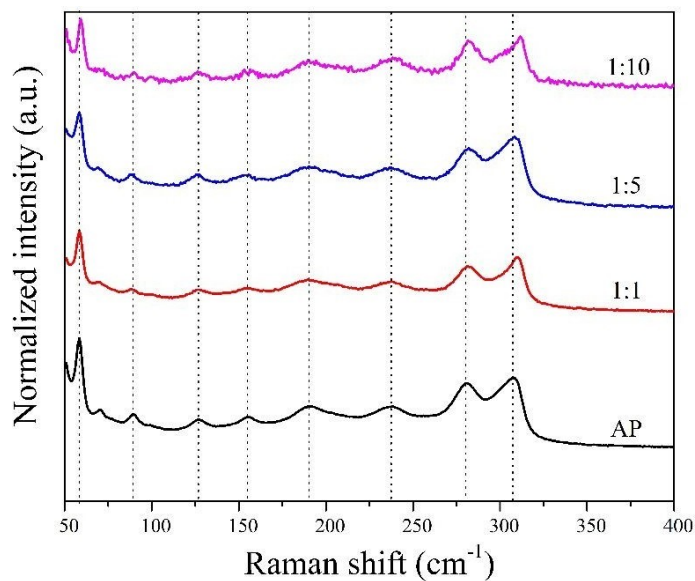


Figure S10. Raman spectra of Sb_2S_3 nanowires deposited from different en: EDT solvent mixture.

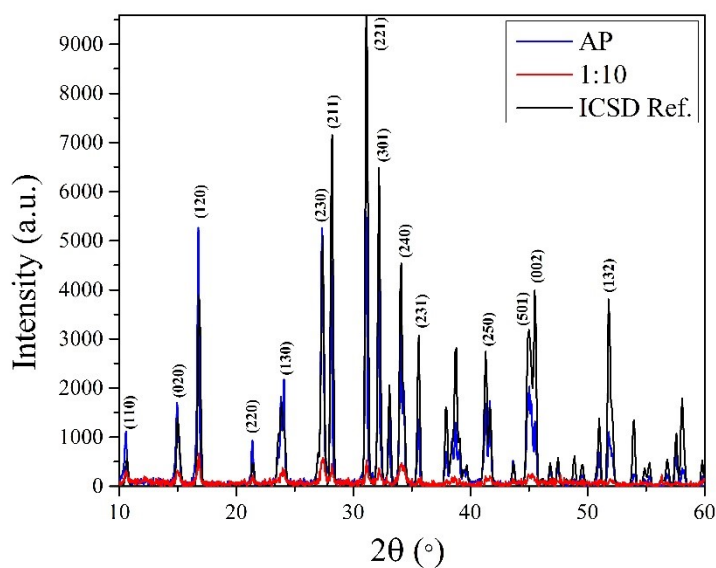


Figure S11. X-Ray Diffraction pattern of Sb_2Se_3 nanowires (post-dissolution en-dilution series) deposited from AP and 1:10 solutions.

Table S4. Se: Sb elemental ratio of antimony selenide NWs calculated from TEM-EDS.

Sample	EDT: en molar ratio	Se to Sb ratio by TEM-EDS (NWs body)	Se to Sb ratio by TEM-EDS (NWs tips)
AP	1: 4.97	1.54 ± 0.04	1.33 ± 0.01
1:1	1: 5.13	1.48 ± 0.03	1.43 ± 0.02
1:5	1: 5.76	1.36 ± 0.07	1.24 ± 0.01
1:10	1: 6.54	1.27 ± 0.04	1.23 ± 0.01

Table S5. Se: Sb elemental ratio and % atomic O in antimony selenide NWs (deposited on Au-coated Si substrate) calculated from SEM-EDS

<i>Sample</i>	<i>Se/Sb atomic ratio</i>	<i>O (atomic)</i>
<i>1:1</i>	1.26 ± 0.10	3.80 ± 0.14
<i>1:4</i>	1.14 ± 0.03	3.17 ± 0.71
<i>1:5</i>	0.93 ± 0.08	2.73 ± 2.33
<i>1:10</i>	0.71 ± 0.01	4.27 ± 0.22