

Supporting Information for

**Tunability of Monodispersed Intermetallic AuCu Nanoparticles through Understanding of  
Reaction Pathways**

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**Table S1.** This table lists the surfactant-to-metal precursor ratio, oleylamine and oleic acid concentrations.

Dispersions	Surfactants-to-Metal Precursor Ratio	Oleylamine (mL)	Oleic acid (mL)	HAuCl <sub>4</sub> (mmol)	Cu(acac) <sub>2</sub> (mmol)
1	1:1	0.12	0.1	0.18	0.20
2	10:1	1.2	1.0	0.18	0.20
3	20:1	2.4	2.0	0.18	0.20
4	40:1	4.8	4.0	0.18	0.20
5	80:1	8.5	8.0	0.18	0.20

**Table S2.A** table listing the amount of oleylamine-to-oleic acid ratio and extracted specimen temperature for the dispersion 6, 7, and 8.

Dispersions	Molar ratio (Oleylamine/Oleic acid)	Oleylamine (mL)	Oleic Acid (mL)	H <sub>2</sub> AuCl <sub>4</sub> (mmol)	Cu(acac) <sub>2</sub> (mmol)
6	0.3	2.5	6.5	0.18	0.20
7	1.0	4.8	4.0	0.18	0.20
8	3.0	6.8	2.0	0.18	0.20

**Table S3.** This table lists the ingredients for step I and step II to synthesized different sizes of Au–Cu nanoparticles.

	Step I					Step II					Size of Au–CuNPs (nm)
	H <sub>2</sub> AuCl <sub>4</sub> (mmol)	HDD (g)	OAm (mL)	T (°C)	Size of Au–NPs (nm)	Cu(acac) <sub>2</sub> (mmol)	HDD (g)	OAm (mL)	OA (mL)	DPE (mL)	
Set 1	0.13	1.0	10	120	4.3±0.8	0.02	0.11	2.0	2.0	10	5.2±0.9
Set 2	0.09	0.20	10	120	5.8±0.9	0.01	0.05	2.0	2.0	10	7.0±1.0
Set 3	0.09	0.20	10	180	8.9±1.5	0.06	0.2	4.0	4.0	10	9.5±1.7