

Electronic Supplementary Information

Embedding Plasmonic Nanoparticles in Soft Crystals: An Approach Exploiting CTAB-I Structures Exploiting CTAB-I Structures

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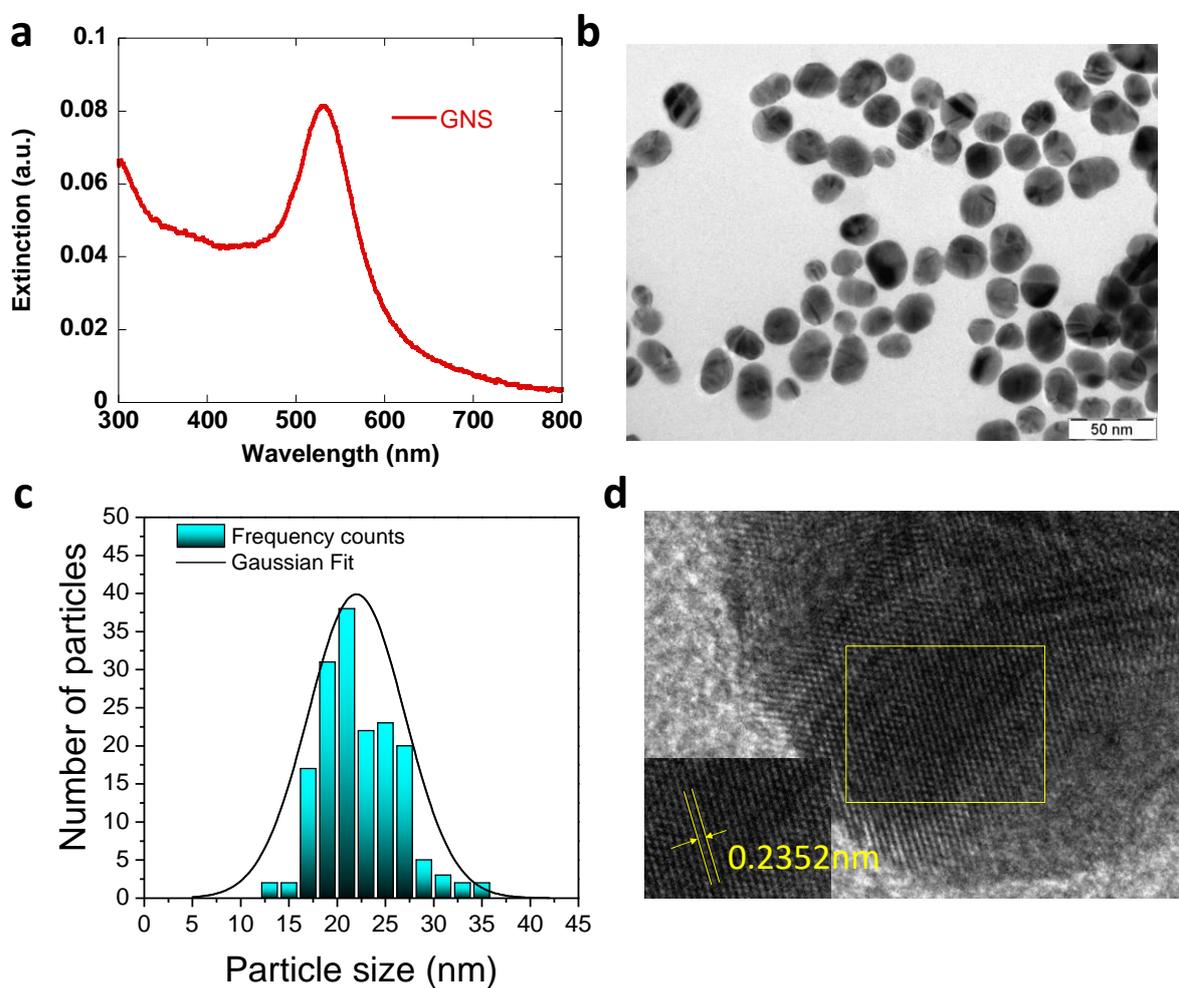
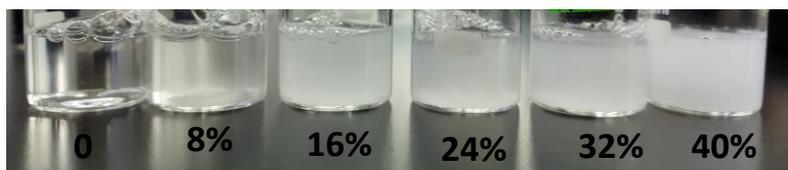


Fig S1. **a)** Extinction spectrum of the GNS used. **b)** TEM image of GNS. **c)** Histogram profile of GNS size distribution. **d)** HRTEM image of the GNS with lattice spacing marked.

a.



↓ 40 °C

b.

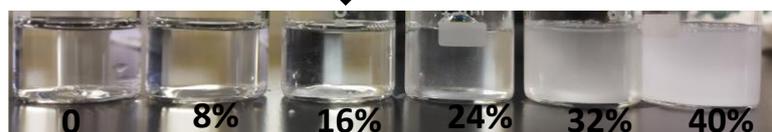


Fig S2. Photographs of KI added CTAB solutions with varying KI concentrations (0-40% VKI/VCTAB) **a)** at room temperature **b)** at 40 °C

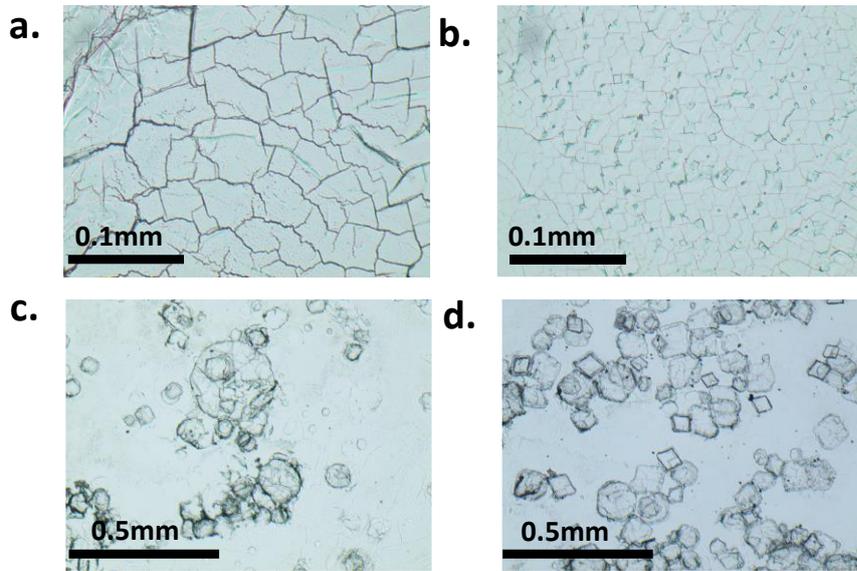


Fig S3. Optical microscope images depicting the formation of sheets with increasing amounts of KI, **(a)**16% **(b)**24% **(c)** 32% **(d)** 40%.

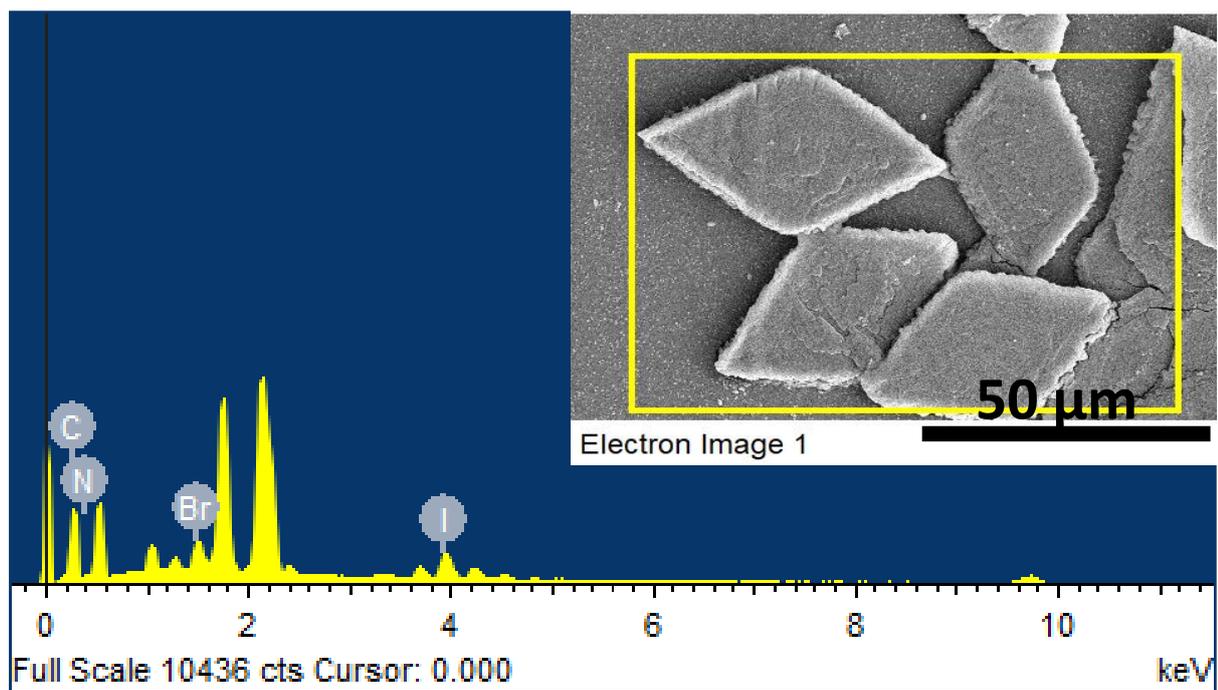


Fig S4. EDS spectrum of CTAB-I sheets

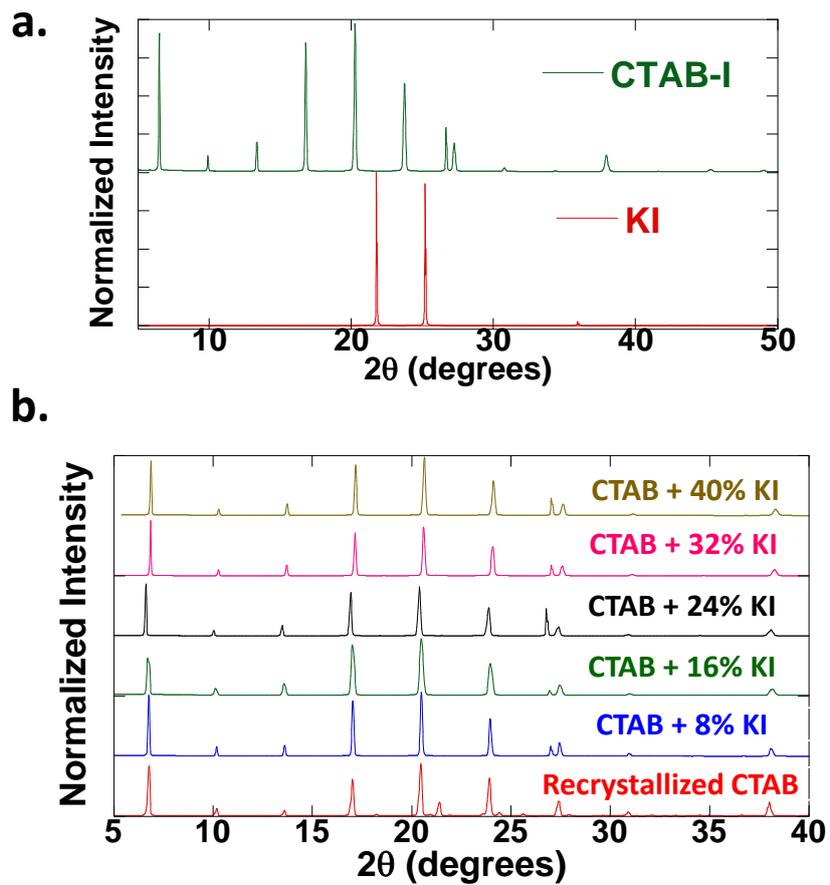


Fig S5. a) Comparison of PXRd pattern of as obtained CTAB-I with standard KI. b) PXRd patterns of different CTAB-I mixtures with varying amounts of KI.

Table S1. List of polymorphs of CTAB with unit cell parameters reported in the literature.

Formula	CCDC number	Space group	a (Å)	b(Å)	c (Å)	α (°)	β (°)	γ (°)	V (Å ³)	Reference
C ₁₉ H ₄₂ N ₁ Br ₁	1122962	P21/c	5.638	7.26	52.072	90	93.78	90	2126.768	35
C ₁₉ H ₄₂ N ₁ Br ₁	1122963	P21/c	5.66	7.26	51.9	90	93.8	90	2127.965	33
C ₁₉ H ₄₂ N ₁ Br ₁	1941222	P21/c	5.633	7.261	52.036	90	93.75	90	2123.701	37

Table S2. Unit cell parameters of polymorphs of CTAI, reported in the literature.

Formula	CCDC number	Space group	a (Å)	b(Å)	c (Å)	α (°)	β (°)	γ (°)	V (Å ³)	Reference
C ₁₉ H ₄₂ N ₁ I ₅	766104	P-1	9.55	9.763	32.682	90.58	90.26	91.49	3045.947	36
C ₁₉ H ₄₂ N ₁ I ₃	679105	P-1	7.715	7.807	22.716	81.83	82.59	88.73	1342.81	36
C ₁₉ H ₄₂ N ₁ I ₁	766103	P21/m	5.784	7.544	25.887	90	95.4	90	1124.604	36
C ₃₈ H ₈₂ N ₂ I ₁₀ *	699988	P21/c	8.448	60.484	12.069	90	108.83	90	5836.938	34
C ₃₈ H ₈₂ N ₂ I ₆ *	699988	P-1	7.828	8.556	21.803	91.07	96.92	116.14	1297.185	34
C ₃₈ H ₈₂ N ₂ I ₂ *	699988	P-1	7.243	8.866	18.812	82.78	81.08	65.94	1087.056	34

* Polyiodides

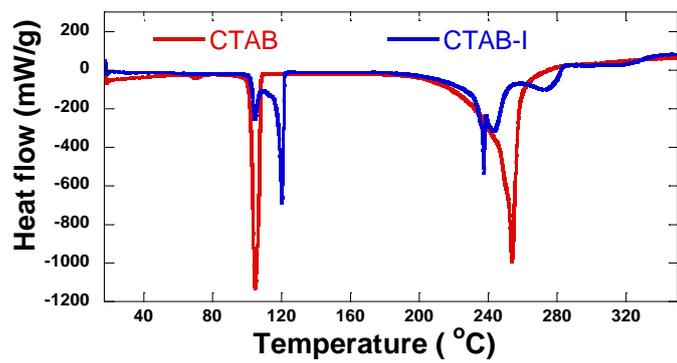
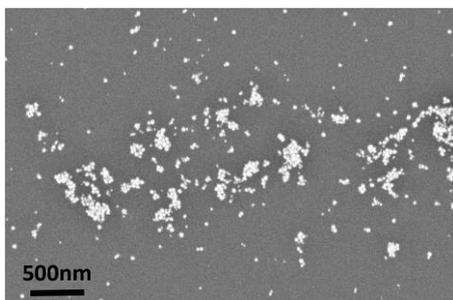


Fig S6. DTA curves of pure CTAB and CTAB-I phase.

a.



b.

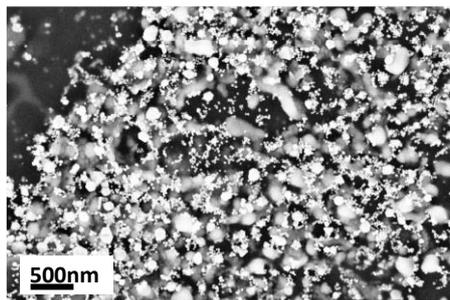


Fig S7 SEM images of GNS depicting the effects of KI **a)** before **b)** after the addition of KI.