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Supporting Information

Title

Surfaces and Interfaces of Liquid Metal Core-Shell Nanoparticles under the Microscope

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Figure S1 Raman spectra of EGaIn CSNs coated with carboxylic acids of different alkyl chain length (C2-C18)

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Figure S2 DRIFTS spectra of EGaIn CSNs coated with carboxylic acids of different alkyl chain

length (C2-C18)

60 60 80 (a) 50 (b) (c) 50 60 40 40 Counts Counts Counts 30 30 40 20 20 20 10 10 0 0 30 40 50 60 70 80 90 0 0 10 20 30 40 50 60 70 80 90 Height (nm) 10 20 ò 0 10 20 30 40 50 60 70 80 90 Height (nm) Height (nm) 60 120 (d) (f) 50 100 (e) 30 40 80 Counts Counts Counts 20 60 30 40 20 10 20 10 0 · 0 -0 0 10 20 30 40 50 60 70 80 90 Height (nm) 10 20 30 40 50 60 70 80 90 Height (nm) ò ò 40 50 60 70 80 90 10 20 30 Height (nm) 30 80 60 (g) (h) 25 50 (i) 60 20 40 Counts Counts Counts 40 15 30 10 20 20 5 10 0 0. 0 10 20 30 40 50 60 70 80 90 Height (nm) 0 10 20 30 40 50 60 70 80 90 Height (nm) ò 10 20 30 40 50 60 70 80 90 Height (nm) ò 80 (j) 60 Counts 40 20 0 | 0 10 20 30 40 50 60 70 80 90

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Figure S3 AFM size distribution of 200 EGaIn CSNs coated with different carboxylic acids (a) C0 (b) C2 (c) C4 (d) C6 (e) C8 (f) C10 (g) C12 (h) C14 (i) C16 (j) C18.

Height (nm)

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Ligand Identifiers	Polydispersity index (PDI)	Standard deviation
C18	0.953	0.075
C16	0.706	0.205
C14	0.422	0.515
C12	0.807	0.197
C10	0.818	0.033
C8	0.625	0.346
C6	0.673	0.219
C4	0.94	0.103
C2	0.585	0.214
C0	0.843	0.082
	Ligand Identifiers C18 C16 C14 C12 C10 C8 C6 C4 C2 C0	Ligand IdentifiersPolydispersity index (PDI)C180.953C160.706C140.422C120.807C100.818C80.625C60.673C40.94C20.585C00.843

Table S4 Polydispersity indices of EGaIn CSNs coated with all the carboxylate acids from DLS

 measurements



Figure S5 15 approach curves for C8 used to calculate average shell stiffness



Figure S6 Force distance curves of EGaIn CSNs coated with different carboxylic acids (a) C0 (b) C2 (c) C4 (d) C6 (e) C8 (f) C10 (g) C12 (h) C14 (i) C16 (j) C18.