Supporting Information

Surface Engineering of Liquid Metal Nanodroplets by Attachable Diblock Copolymers

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Table S1. The molecular weight (MW) information of PMMA-*b*-P*t*BA copolymers determined by THF GPC using linear PMMA standard. MW of PEO-*b*-P*t*BA was determined by DMF GPC using PEO as standard.

Entry	Copolymers	M_n (g/mol)	M_w/M_n
1	$PMMA_{65}$-*b*-P*t*BA_{12}	7800	1.13
2	$PMMA_{65}$-*b*-P*t*BA_{27}	11000	1.17
3	$PMMA_{65}$-*b*-P*t*BA_{45}	13000	1.19
4	PEO5k-*b*-P*t*BA_{18}	5600	1.16

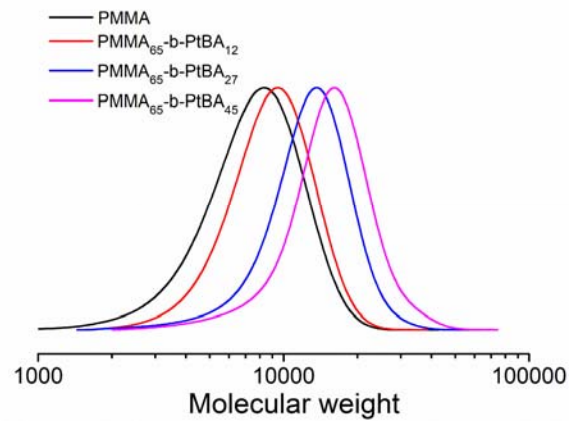

Figure S1. GPC traces of PMMA-*b*-P*t*BA copolymer with different length of P*t*BA block.

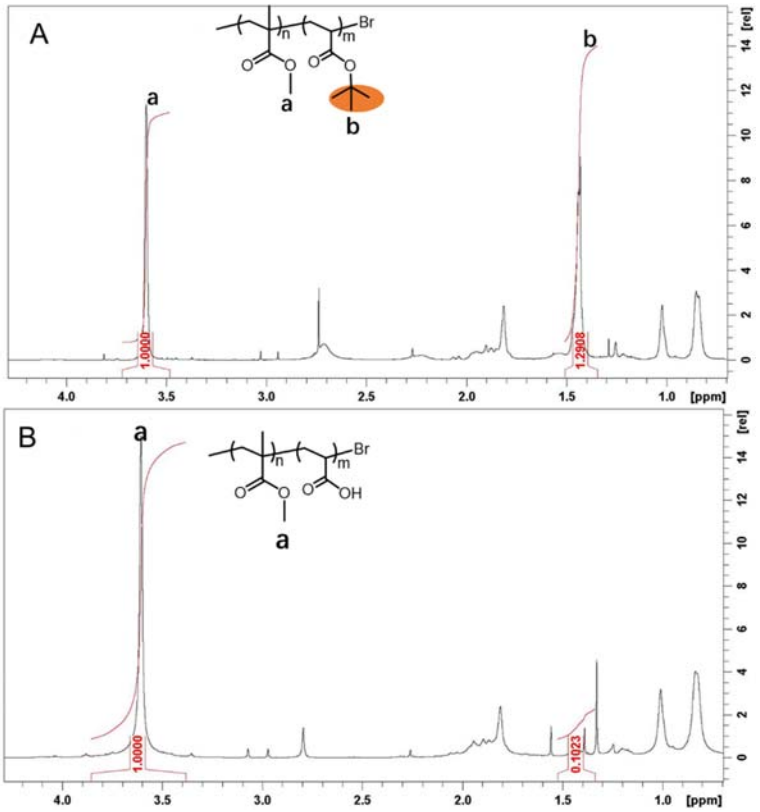

Figure S2. ^{1}H-NMR spectra of PMMA$_{65}$-*b*-P*t*BA$_{27}$ copolymer before (A) and after (B) deprotection of *tert*-butyl groups. It shows that > 93% of *tert*-butyl groups was converted to acrylic acid groups.

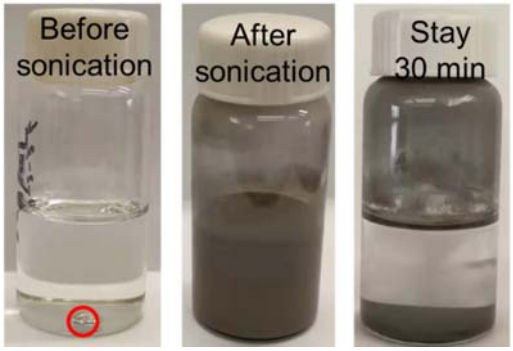

Figure S3. Photographs showing the EGaIn droplets prepared in DMF without any surfactant.

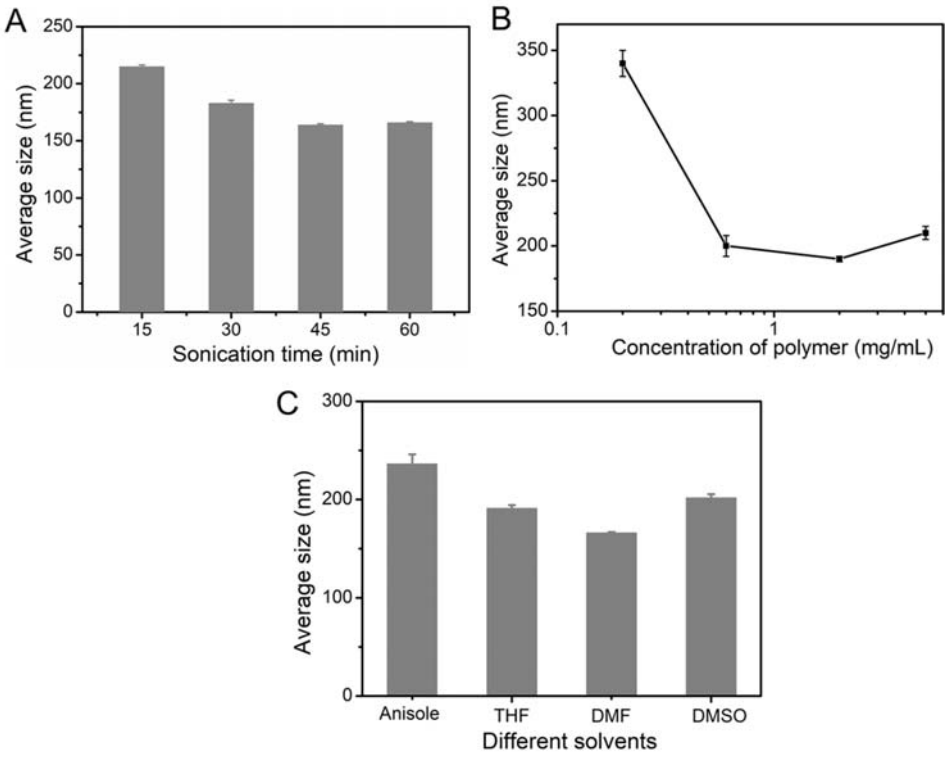

Figure S4. Effect of sonication time, concentration of copolymers and solvents on average droplets sizes and size distributions.

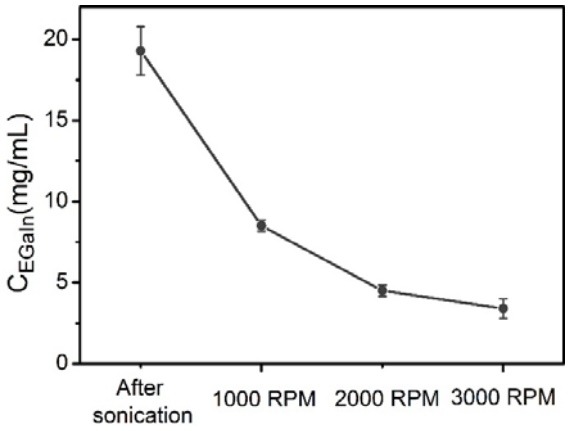

Figure S5. The dependence of concentration of EGaIn nanodroplets on the rotational speed of centrifugation during size grading process.

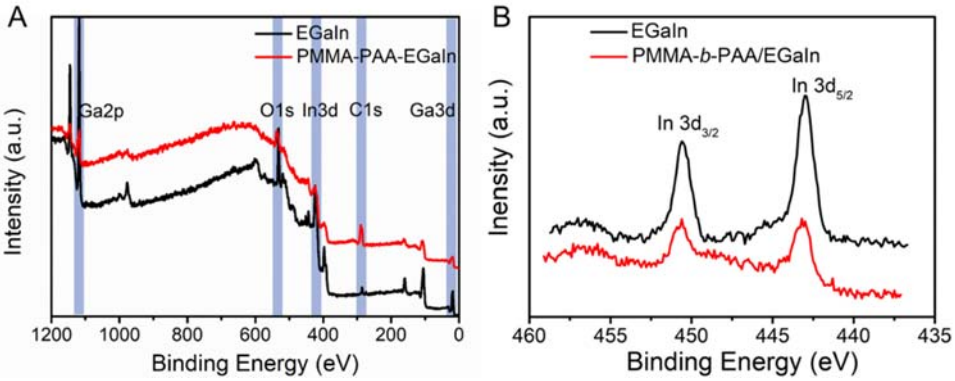

Figure S6. XPS spectra (A) and In 3d high resolution spectra (B) of EGaIn droplets without polymer and EGaIn nanodroplets stabilized by PMMA-*b*-PAA.

Table S2. XPS elements ratio analysis of EGaIn nanodroplets.

Samples	**Elements ratio (%)**			
	C	**O**	**Ga**	**In**
EGaIn droplet without polymer	17.08	64.13	16.76	2.03
PMMA-*b*-PAA/ EGaIn nanodroplets	71.48	25.14	2.91	0.47

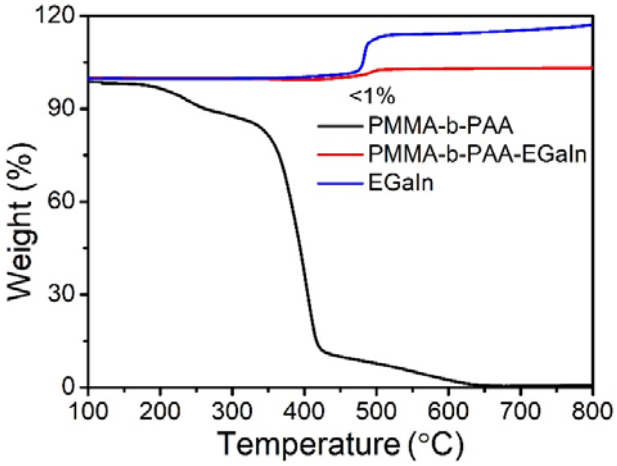

Figure S7. TGA curves of $PMMA_{65}$-*b*-PAA_{12} copolymer, EGaIn droplets without polymer and EGaIn nanodroplets stabilized by $PMMA_{65}$-*b*-PAA_{12}.

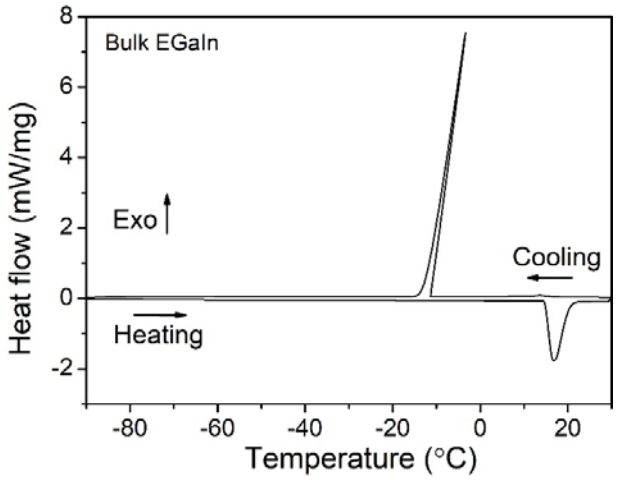

Figure S8. DSC curve of bulk EGaIn.

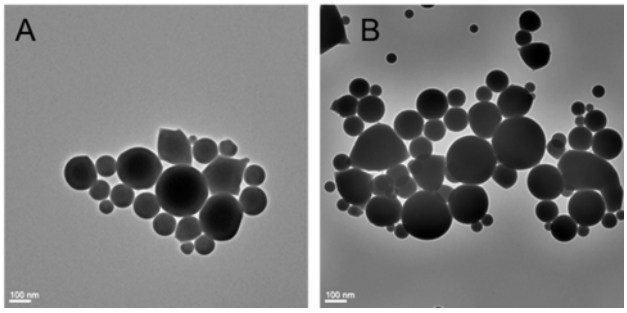

Figure S9. TEM images of EGaIn nanodroplets stabilized by $PMMA_{65}$-*b*-PAA_{27} (A) and $PMMA_{65}$-*b*-PAA_{45} (B).

Table S3. Summary of EGaIn nanodroplets stabilized by PMMA-*b*-PAA block copolymers with different lengths of PAA block.

Copolymers	**Average size**	**PDI**	**Fraction of attached polymer**
$PMMA_{65}$-*b*-PAA_{12}	165 nm	0.13	0.6%
$PMMA_{65}$-*b*-PAA_{27}	154 nm	0.23	0.25%
$PMMA_{65}$-*b*-PAA_{45}	176 nm	0.29	0.1%

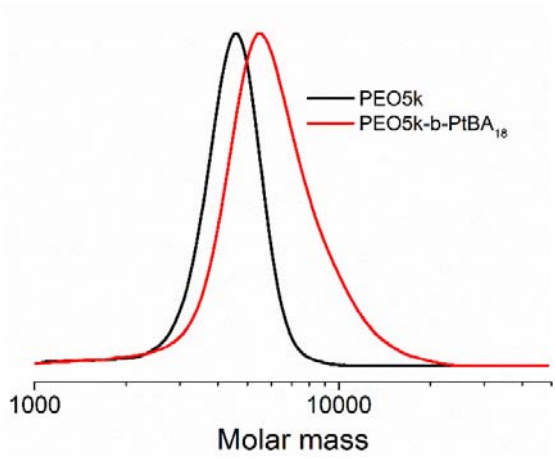

Figure S10. GPC traces of PEO5k macroinitiator and PEO-*b*-P*t*BA copolymer determined by DMF GPC using PEO as standard.

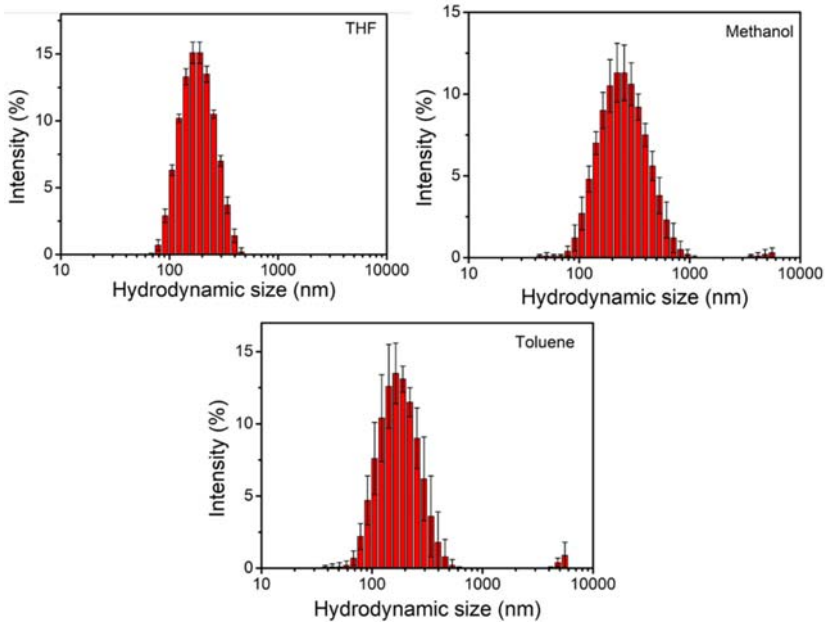

Figure S11. DLS analysis EGaIn nanodroplets stabilized by PEO-*b*-PAA in THF, methanol and toluene.

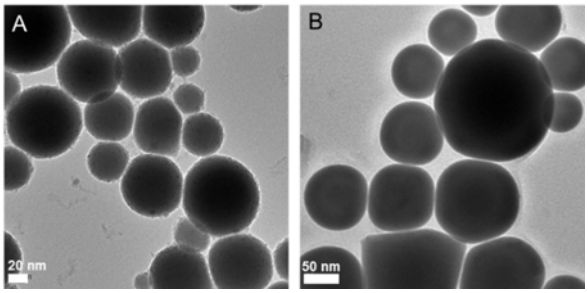

Figure S12. Enlarged TEM images of PEO-b-PAA/EGaIn nanodroplets prepared in water (A) and DMF (B).

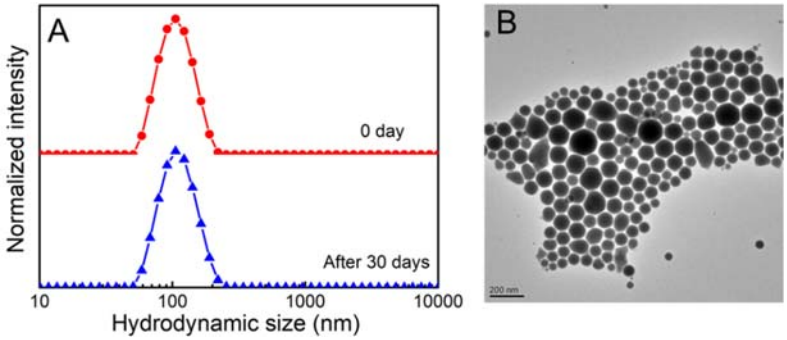

Figure S13. DLS analysis of freshly prepared EGaIn nanodroplets stabilized by PEO-*b*-PAA and the same sample after stored 30 days in DMF (A) and TEM image after stored 30 days (B).

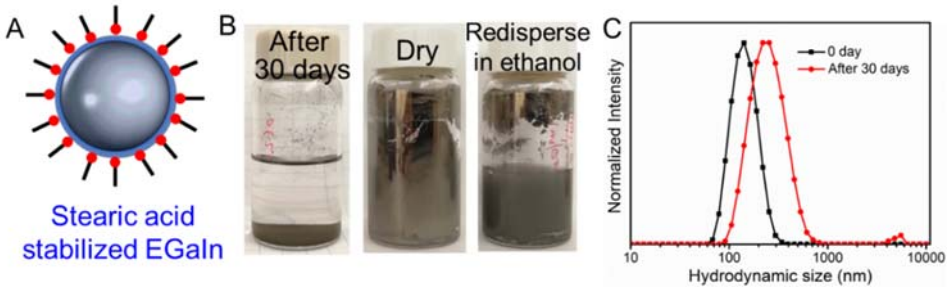

Figure S14. Stability of stearic acid (SA)-stabilized EGaIn nanodroplets. (A) Schematic illustration; (B) photographs of SA-stabilized EGaIn nanodroplets after 30 days in ethanol, evaporating the solvent and redispersed in ethanol; (C) DLS analysis of freshly prepared SA-stabilized EGaIn nanodroplets (The suspension was graded by centrifugation to remove large size droplets) and the sample storing after 30 days in ethanol (Ultrasonic bath was used to assist the redispersion of settled EGaIn

nanodroplets before DLS analysis).