Supporting Information

Ligand Displacement Induced Morphologies in Block Copolymer/Quantum Dot Hybrids and Formation of Core-Shell Hybrid Nanoobjects

Sajan Singh,^a Pratick Samanta,^a Rajiv Srivastava,^a Andriy Horechyy,^b Uta Reuter,^b Manfred Stamm,^{b c} Hsin-Lung Chen^d and Bhanu Nandan^a*

^a Department of Textile Technology, Indian Institute of Technology Delhi, Hauz Khas, New Delhi 110016 (India). E-mail: nandan@textile.iitd.ac.in

^b Leibniz Institute of Polymer Research Dresden, Hohe Strasse 6, Dresden 01069 (Germany) ^c Technische Universität Dresden, Physical Chemistry of Polymer Materials, Dresden 01062,

(Germany)

^d Department of Chemical Engineering, National Tsing-Hua University, Hsinchu 30013 (Taiwan)

Sample Composition ^a	f _{PS} ^b	fp4vp ^c	fps/topo ^d	fP4VP/CdSe ^e	fp4vp/CdSe/TOP0 ^f
100/0	0.33	0.67	0.33	0.67	0.67
100/10	0.31	0.62	0.36	0.64	0.69
100/20	0.30	0.59	0.39	0.61	0.70
100/30	0.28	0.56	0.42	0.58	0.72
100/40	0.26	0.53	0.44	0.56	0.74
100/50	0.25	0.50	0.46	0.54	0.75

Table S1. Composition details of S1784VP386/CdSe composites

^a composition in terms of PS-b-P4VP/CdSe ratio

^b volume fraction assuming PS phase remains pure

^c volume fraction assuming P4VP phase remains pure

^d volume fraction assuming all TOPO migrates to the PS phase

^e volume fraction assuming CdSe QDs (without TOPO) is in P4VP phase

^f volume fraction assuming CdSe along with TOPO is in P4VP phase

Sample Composition ^a	f _{PS} ^b	<i>f</i> _{P4VP} ^c	fps/topo ^d	fP4VP/CdSe ^e	fp4vp/CdSe/TOP0 ^f
100/0	0.735	0.265	0.735	0.265	0.265
100/10	0.691	0.250	0.740	0.260	0.309
100/20	0.655	0.233	0.748	0.252	0.345
100/30	0.618	0.223	0.750	0.250	0.382
100/40	0.587	0.212	0.754	0.246	0.413
100/50	0.559	0.202	0.758	0.242	0.441
100/60	0.534	0.192	0.761	0.239	0.466

Table S2. Composition details of S5434VP214/CdSe composites

^a composition in terms of PS-b-P4VP/CdSe ratio

^b volume fraction assuming PS phase remains pure

^c volume fraction assuming P4VP phase remains pure

^d volume fraction assuming all TOPO migrates to the PS phase

^e volume fraction assuming CdSe QDs (without TOPO) is in P4VP phase

^f volume fraction assuming CdSe along with TOPO is in P4VP phase



Figure S1. TEM micrograph of neat $S_{178}VP_{386}$ block copolymer clearly revealing the cylindrical morphology formed by the block copolymer. The cross-section along minor as well as major axis of cylindrical domains are clearly visible in the TEM image.



Figure S2. (a) SEM and (b) TEM micrographs of cylindrical nano-objects isolated by selective swelling of neat $S_{178}VP_{386}$ block copolymer in methanol. The result further corroborates the results that the block copolymer self-assembled into cylindrical morphology.



Figure S3. 31P NMR of $S_{178}VP_{386}/CdSe$ composite with triphenylphosphine as an internal reference. A sharp signal was observed at 48 ppm, which corresponded to free TOPO ligands in CDCl₃. This explicitly showed that ligand displacement did occurred in the presence of P4VP.



Figure S4. TGA plot of TOPO bound CdSe QDs from where the amount of ligand bound to CdSe was ascertained.



Figure S5. (a) UV-vis and (b) PL spectra of S₁₇₈VP₃₈₆/CdSe composites in chloroform.



Figure S6. (a) UV-vis and (b) PL spectra of S₅₄₃VP₂₁₄/CdSe composites in chloroform.