Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Information

Short peptide mediated self-assembly of platinum nanocrystals with selective spreading property

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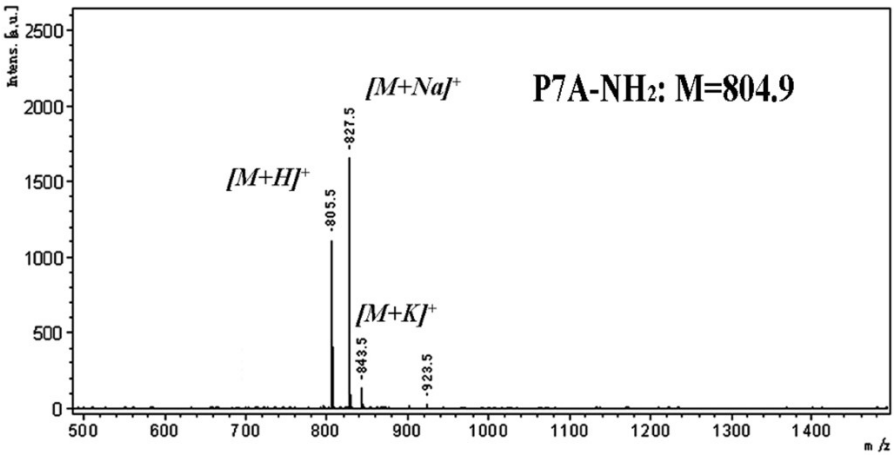

Fig. S1 The MALDI-TOF MS spectrum of the synthesized peptide.

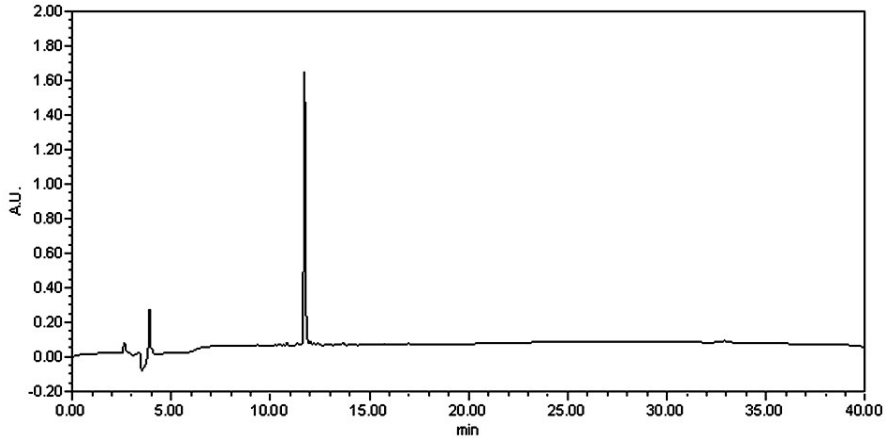

Fig. S2 The RP-HPLC spectrum of the synthesized peptide.

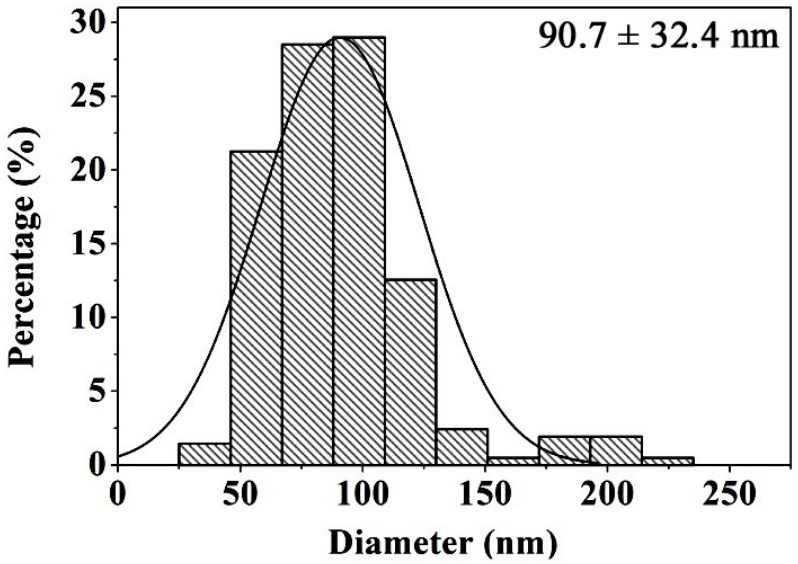

Fig. S3 The statistical diameter distribution of the assembled core/shell spherical nanoassemblies after reacting for one week from TEM (base on 200 time measurements).

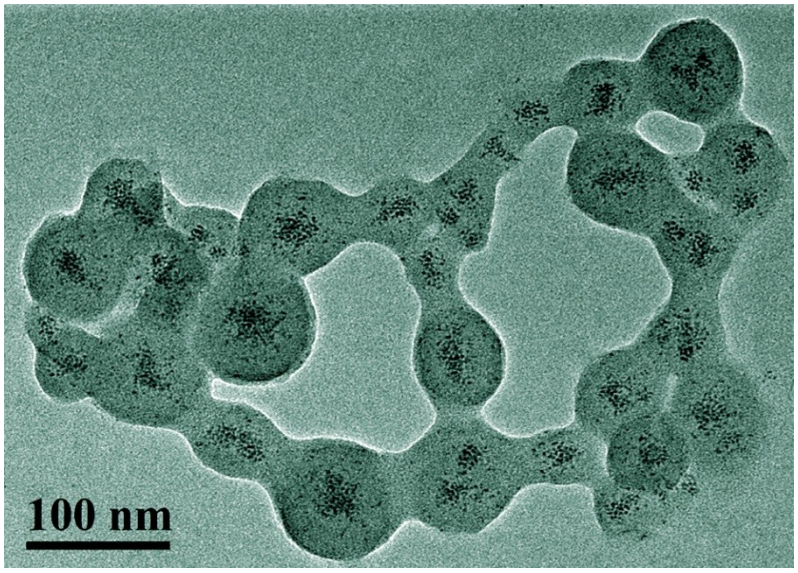

Fig. S4 TEM micrograph showing the "Frog Spawn"-like networks fused by core/shell nanoassemblies at pH 11.5.

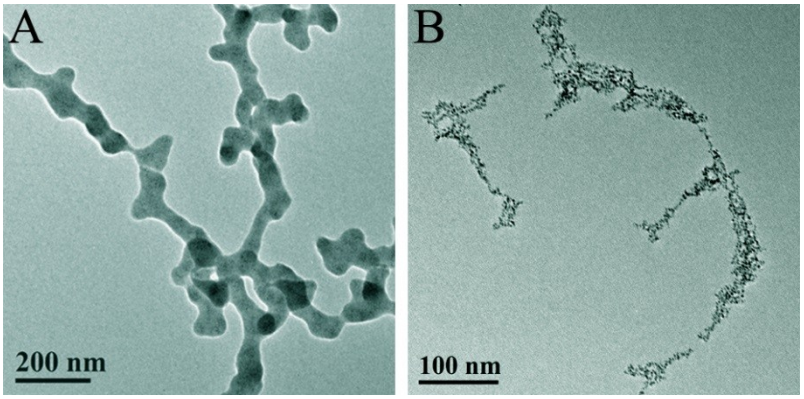

Fig. S5 TEM micrographs showing the irregular superarchitectures assembled by 0.12 mM P7A-capped Pt NCs (A) and blank Pt NCs (B) after reacting for one week.

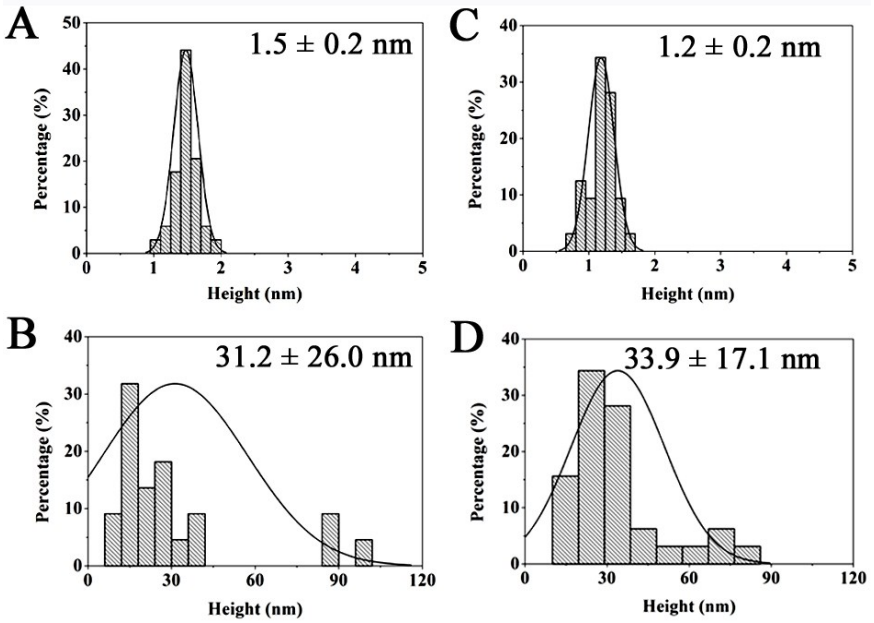

Fig. S6 Statistical height distributions of the assembled core/shell nanoassemblies adsorbed on mica (A, C) and HOPG (B, D) surface. (A, B) for the samples at pH 2.0 (based on 200 measurements), (C, D) for the samples at pH 11.5 (based on 100 measurements).

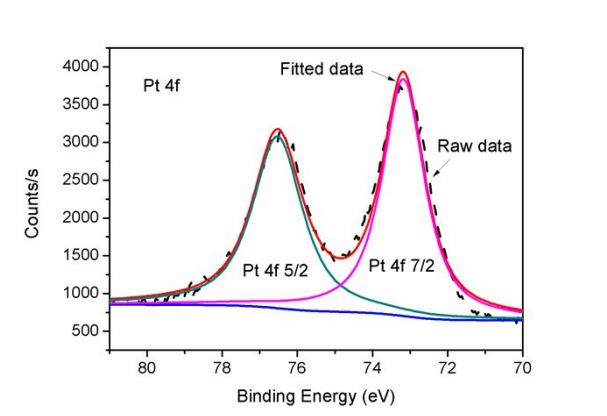

Fig. S7 XPS spectrum of Pt 4f in platinum nanoassemblies. The binding energy of 4f 5/2 and 4f 7/2 positively shifted 2.1 eV due to the nano size effect.[1]

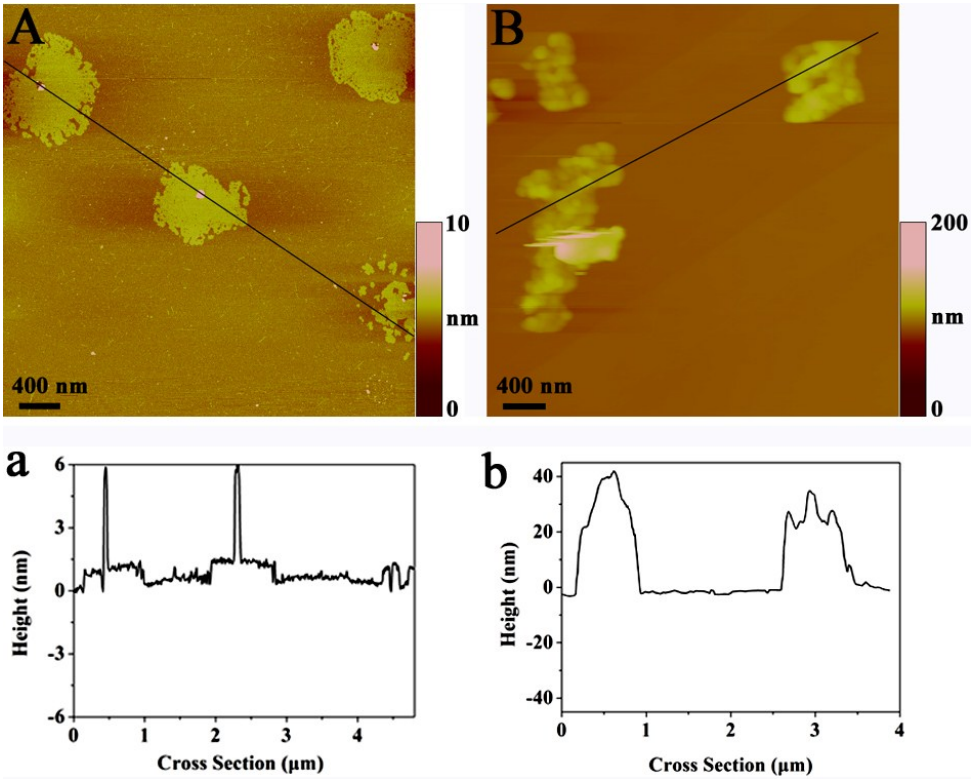

Fig. S8 AFM images representing the assembled core/shell nanoassemblies adsorbed on mica (A) and HOPG (B) surface at pH 11.5. (a) and (b) are the corresponding cross-sectional views of the black lines in (A) and (B), respectively. The images have not been flattened.

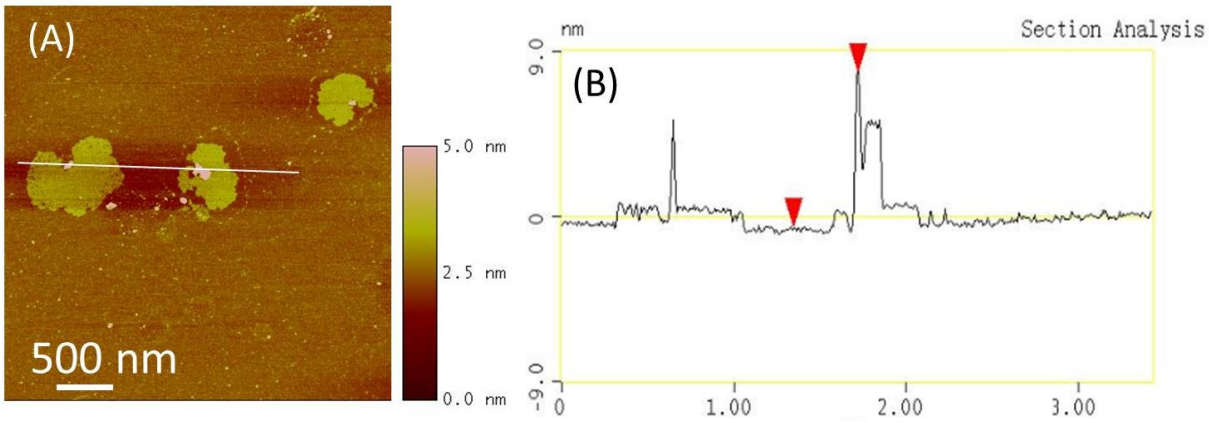

Fig. S9 AFM images representing the assembled core/shell nanoassemblies adsorbed on mica surface at pH 2.0. The sample was freezing dried after adsorbed on mica surface. (B) is the corresponding cross-sectional view of the white line in (A). The images have not been flattened.

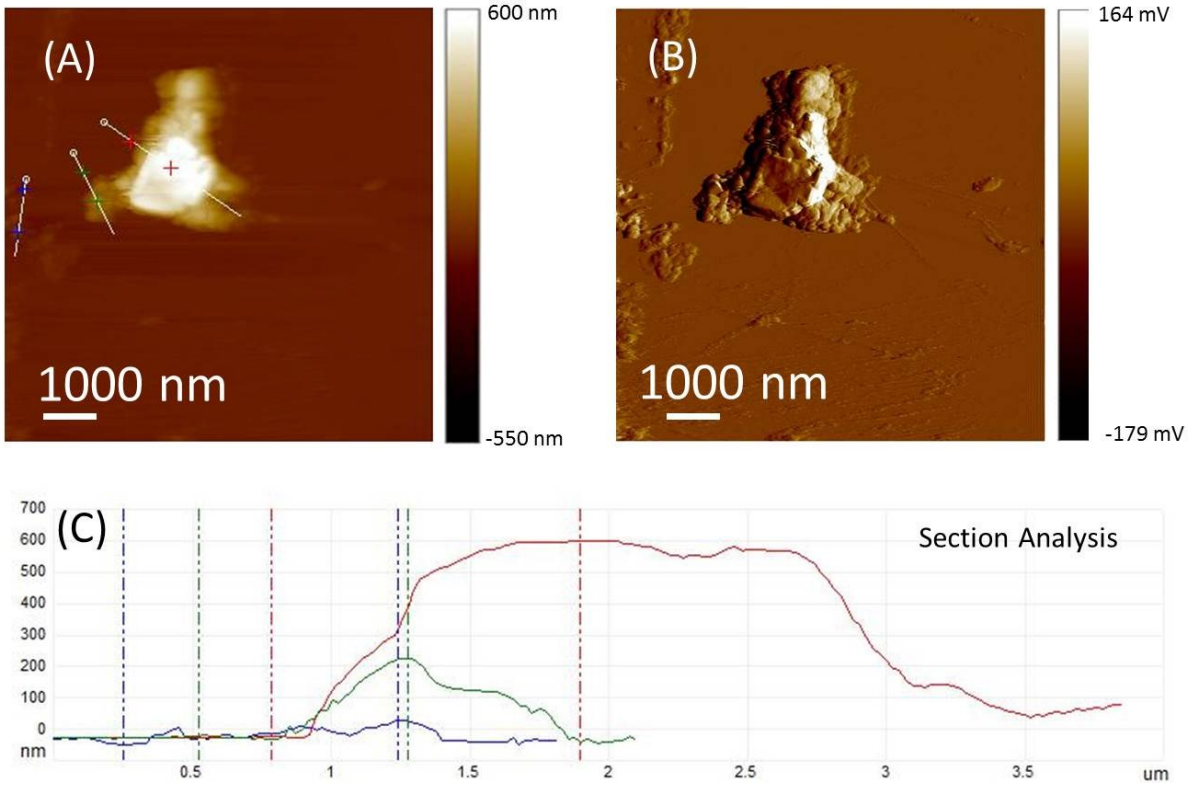

Fig. S10 AFM images representing the assembled core/shell nanoassemblies adsorbed on HOPG surface at pH 2.0. The sample was freezing dried after adsorbed on mica surface. (B)

is the phase image of (A). (C) is the corresponding cross-sectional view of the white line in (A). The images have not been flattened.

Table S1 XPS binding energy (BE), atomic content ratios determined from Figure 3

analysis sample	element	peak assignments	BE /eV	FWHM /eV	area ratio/%	molar ratio/%	chemical shift /eV
Peptide powder	N 1s	Peak 1: N-H	399.5	1.03	66.8	31.7	----
		Peak 2: NH_3^+	400.3	1.31	33.2		----
	O 1s	Peak 1: C=O	531.6	1.23	58.7	11.5	----
		Peak 2: O-H	533.0	1.36	41.3		----
	C 1s	Peak 1: C-C, C-H	284.7	0.87	53.0	56.8	----
		Peak 2: C-H[a]	285.3	0.68	15.2		----
		Peak 3: C-N	286.2	1.12	22.4		----
		Peak 4: C=O	288.4	1.08	9.4		----
Peptide on Pt surface	N 1s	Peak1: N-H	399.3	0.88	76.0	17.1	-0.2
		Peak 2: NH_2	399.9	0.76	24.0		-0.4
	O 1s	Peak 1: C=O	531.9	1.07	52.6	17.6	0.3
		Peak 2: O-H	533.2	1.24	47.4		0.2
	C 1s	Peak 1: C-C, C-H	284.7	0.85	49.1	64.1[b]	0
		Peak 2: C-H[a]	285.3	0.80	29.6		0
		Peak 3: C-N	286.4	0.99	14.1		0.2
		Peak 4: C=O	288.8	0.80	7.2		0.4

a: C-H in α position of carbonyl group
b: the surface element molar content also include platinum of 1.2%

Reference:
1. L.Qiu, F. Liu, L. Zhao, W. Yang, and J. Yao, *Langmuir*, 2006, **22**, 4480-4482.