Electronic Supporting Information

Controlled Synthesis of Soluble Conjugated Polymeric Nanoparticles for Fluorescence Detection

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Synthetic Procedures for SCPNs:

SCPN1: Following the similar procedure as that for SCPN3. 1,3,5-Tris(4-iodophenyl) benzene (0.137 g, 0.2 mmol), p-phenylenediboronic acid (0.05 g, 0.3 mmol), TBAF (0.568 g,1.8 mmol), Pd@SS-CNM (5 mg, 1.1 μmol of Pd), and DMF (2 mL) were used in this polymerization. The polymerization was conducted at 100 ºC to generate the product (20 mg, 24.0%).

SCPN2: Tris(4-iodopheny) amine (0.125 g, 0.2 mmol), p-phenylenediboronic acid (0.05 g, 0.3 mmol), TBAF (0.568 g,1.8 mmol), Pd@SS-CNM (5 mg, 1.1 μmol of Pd), and DMF (2 mL) were used in this polymerization. The polymerization was conducted at 80 ºC to generate the product (25mg, 35.1%).

SCPN4: Tetra(4-bromophenyl)ethylene (0.067g, 0.1 mmol), p-phenylenediboronic acid (0.03 g, 0.2 mmol), TBAF (0.284 g,0.9 mmol), Pd@SS-CNM (5 mg, 1.1 μmol of Pd), and DMF (2 mL) were used in this polymerization. The polymerization was conducted at 120 ºC to generate the product (23.3mg, 47.1%).

SCPN5: 1,3,6,8-Tetrabromopyrene (0.097g, 0.188 mmol), p-phenylenediboronic acid (0.06 g, 0.375 mmol), TBAF (0.534 g, 1.7 mmol), Pd@ SS-CNM (5 mg, 1.1 μmol of Pd), and DMF (2 mL) were used in this polymerization. The polymerization was conducted at 120 ºC to generate the product (28 mg, 42.6 %).

SCPN6: 2,2',7,7'-Tetrabromo-9,9'-spirobifluorene (0.063 g, 0.1 mmol), 4,4'-biphenydiboronic acid (0.05 g, 0.2 mmol), TBAF (0.284 g, 0.9 mmol), Pd@SS-CNM (5 mg, 1.1 μmol of Pd), and DMF (2 mL) were used in this polymerization. The polymerization was conducted at 120 °C to generate the product (20 mg, 32.4 %).

SCPN7: Tetra(4-bromophenyl)ethylene (0.067 g, 0.1 mmol), 4,4'-biphenydiboronic acid (0.05 g, 0.2 mmol), TBAF (0.284 g,0.9 mmol), Pd@SS-CNM (5 mg, 1.1 μmol of Pd), and DMF (2 mL) were used in this polymerization. The polymerization was conducted at 120 ºC to generate the product (26.0 mg, 40.2%).

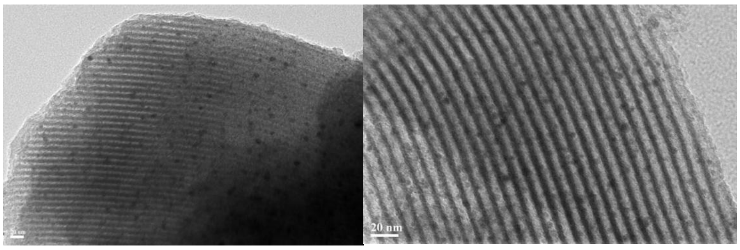

Figure S1: TEM images of Pd@SS-CNMs nanoreactors

Figure S2: SCPNs in THF solutions

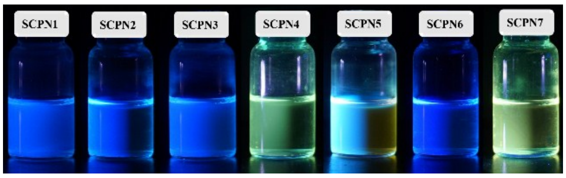

Figure S3: SCPNs in THF solutions under the irradiation of 365 nm light

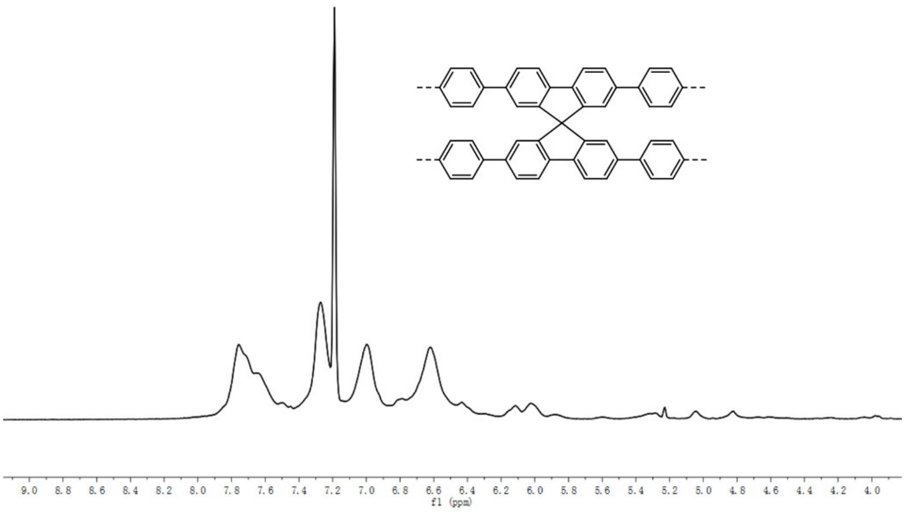

Figure S4. ^{1}H NMR spectrum of SCPN 3 in $CDCl_3$

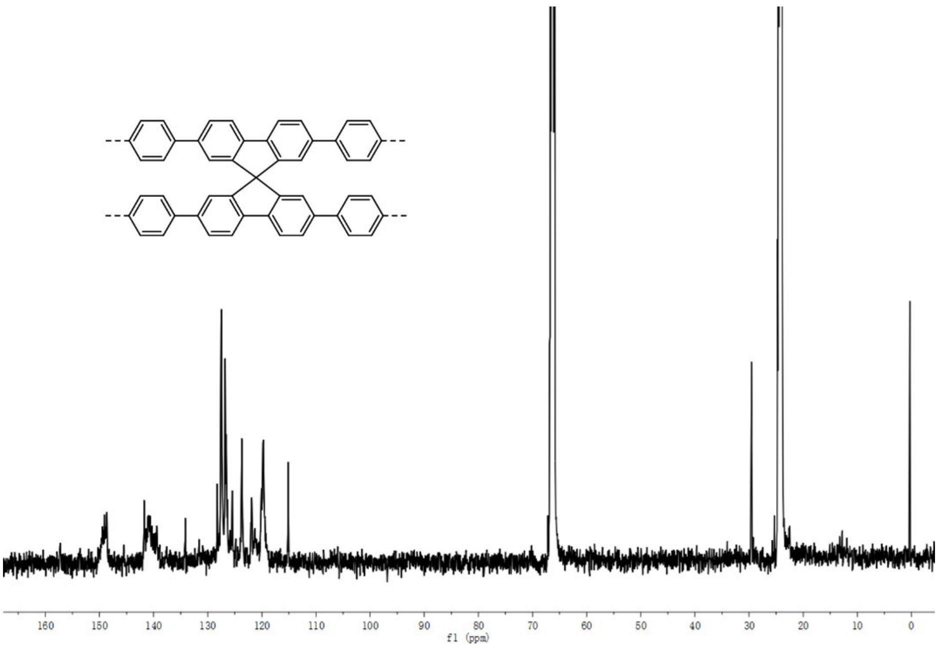

Figure S5. ^{13}C NMR spectrum of SCPN 3 in THF-d8

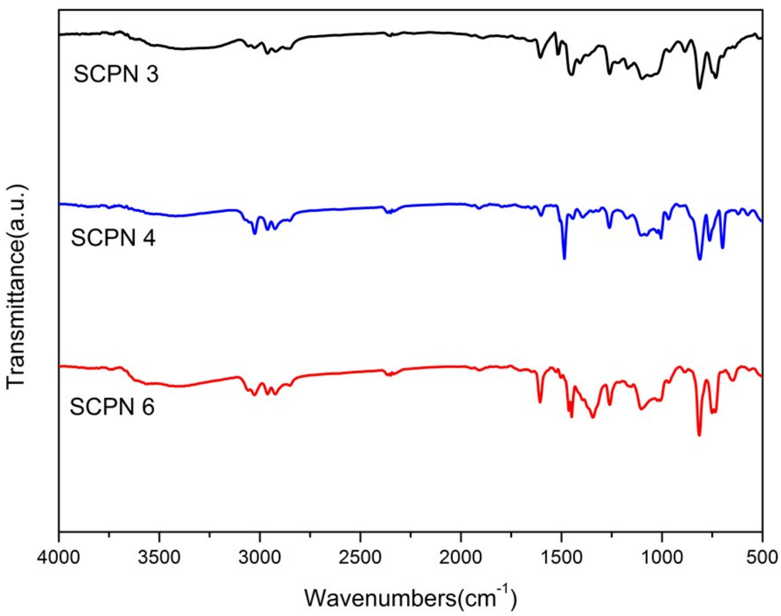

Figure S6. FT-IR spectra of SCPNs

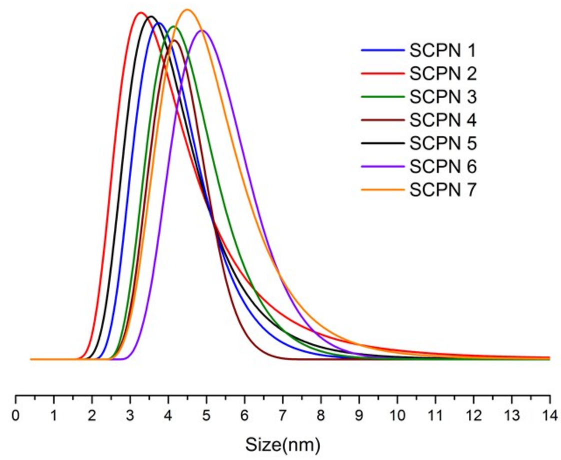

Figure S7: Normalized size distributions of all the SCPNs in DMF obtained with DLS.

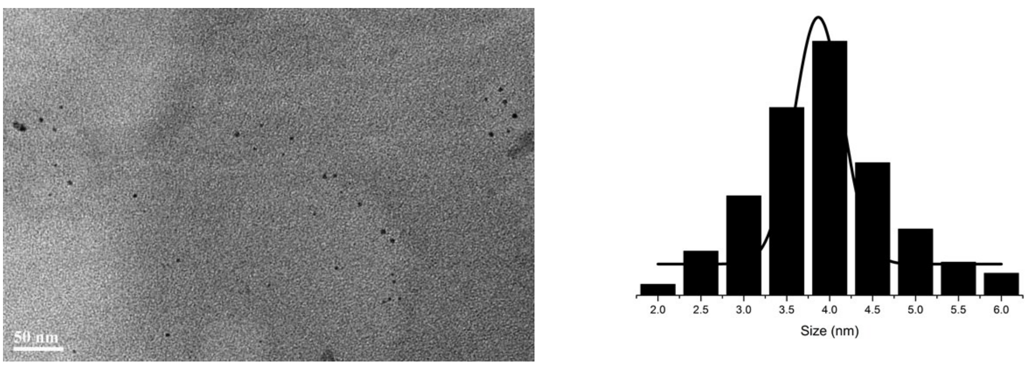

Figure S8: TEM image and size distribution histogram of SCPN4.

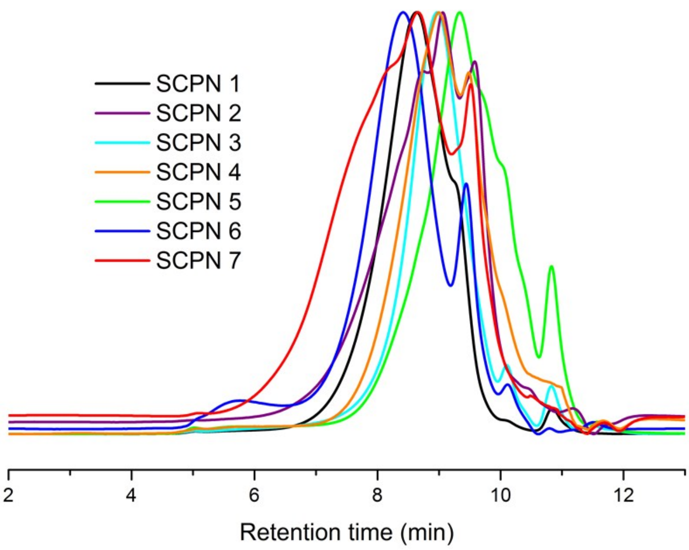

Figure S9: GPC spectra of SCPNs

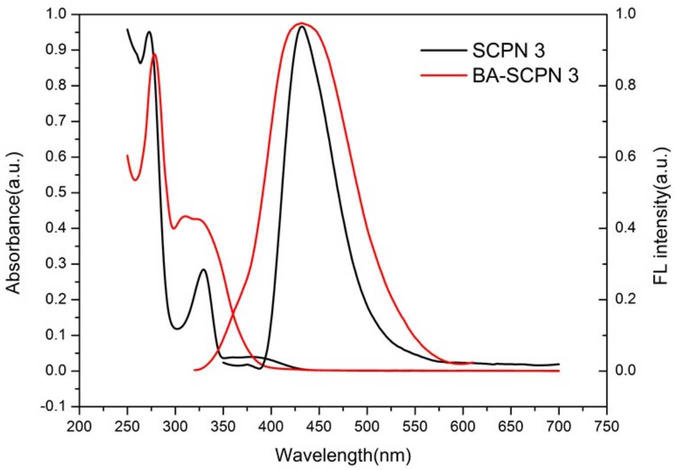

Figure S10: Normalized UV-vis spectra and photoluminescence spectra of SCPN before and after surface modification. (black: SCPN 3; red: BA-SCPN 3)

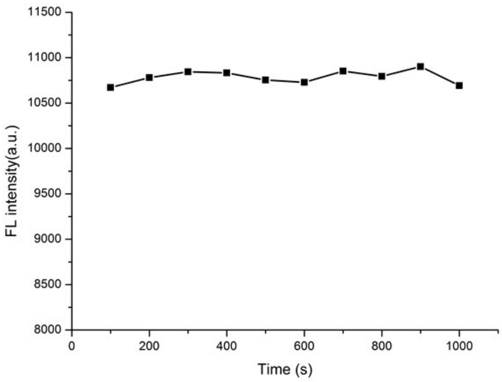

Figure S11: Photostability of BA-SCPN 3 upon continuous irradiation with a laser light at 350 nm for 0-1000s

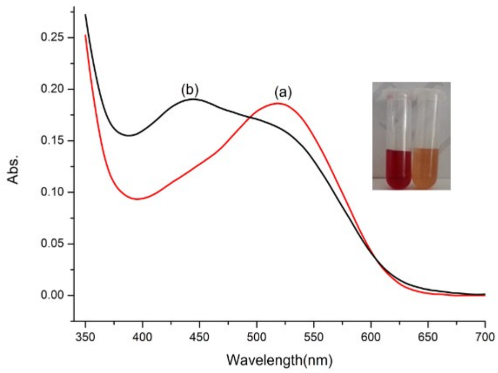

Figure S12: (a) ARS (b) ARS treated with BA-SCPN 3. (Inset) Images of the samples

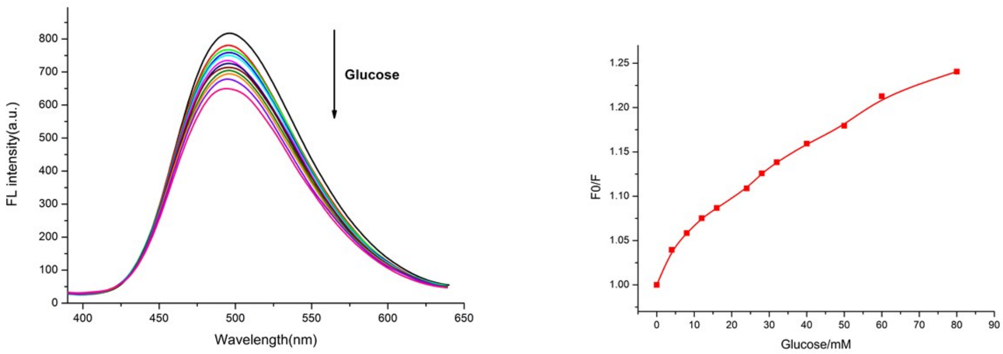

Figure S13: FL spectra of BA-SCPN 4 quenched by various amount of glucose (ranged from 0 to 80 mM) in a pH 9.2 PBS buffer. (b) Plot of the relative intensity of FL (F_0/F) versus the glucose concentration measured at 330 nm. F_0 and F are the FL intensity of SCPNs in the absence and presence of glucose, respectively.

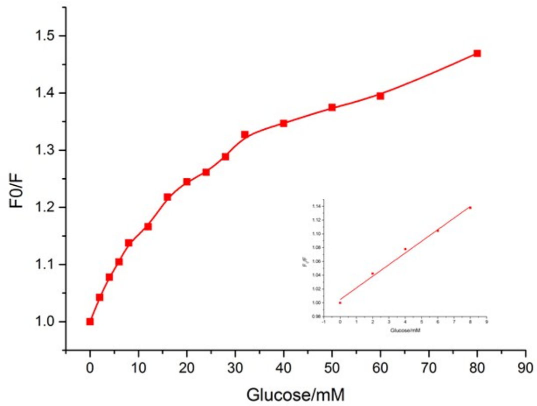

Figure S14: Plot of the relative intensity of FL (F_0/F) versus the glucose concentration measured at 330 nm. F_0 and F are the FL intensity of SCPN 3 in the absence and presence of glucose, respectively.

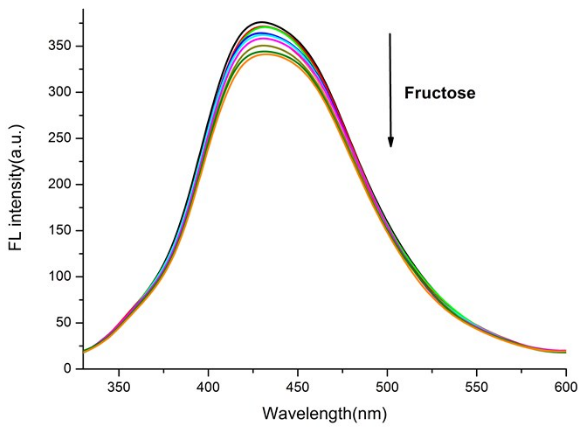

Figure S15: FL spectra of BA-SCPN 3 quenched by various amount of fructose (ranged from 0 to 80 mM) in a pH 9.2 PBS buffer.

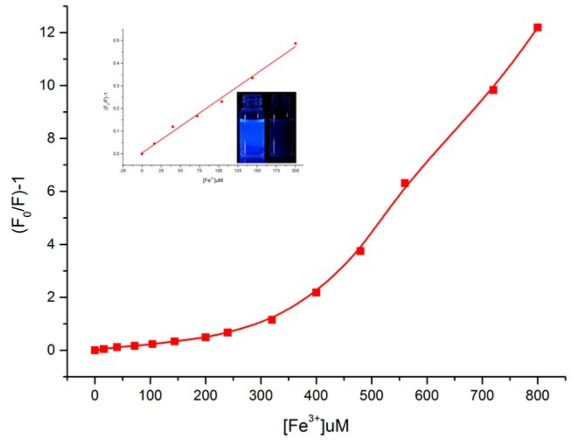

Figure S16: Plot of the relative intensity of FL (F_0/F) versus the Fe^{3+} concentration measured at 330 nm. F_0 and F are the FL intensity of SCPN 3 in the absence and presence of Fe^{3+}, respectively.

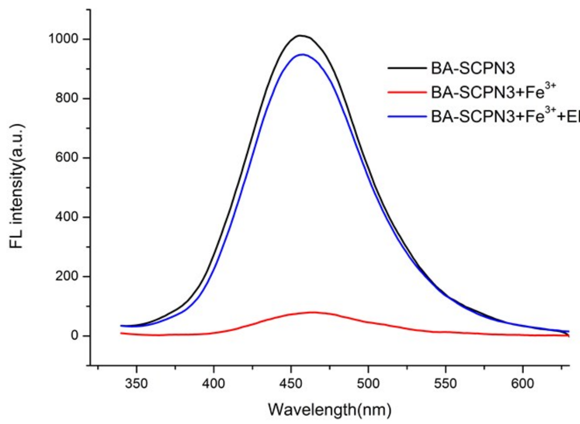

Figure S17: Fluorescence spectra of BA-SCPN 3 (black), BA-SCPN 3+Fe^{3+} (red), and BA-SCPN 3+Fe^{3+}+EDTA mixture (blue). The concentrations of Fe^{3+} and EDTA are 0.8 mM and 1 mM, respectively.