Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supporting Information for:

Utilization of bifunctional ruthenium complex as efficient catalyst for RAFT controlled photopolymerization and simultaneously sensing probe for facile fabrication of ECL platform

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Table S1. Parameters of the prepared polymers in the absence of visible light illumination.

Entry	SSS/PCETP/Ru	Time (h)	Con[c] (%)	Mn[b]	Mn[a]	Đ[a]
1	50 : 1 : 0.040	24	0	0	0	0
2	100 : 1 : 0.040	24	0	0	0	0
3	200 : 1 : 0.040	24	0	0	0	0
4	400 : 1 : 0.040	24	0	0	0	0

Table S2. Parameters of PSS (Entry 10) via Ru-complex catalyzed photopolymerizations

Time (h)	Conversion[c] (%)	Mn[a] (g/mol)	Đ[a]	Mn[c] (g/mol)	Mn[b] (g/mol)
1	9.9	4400	1.19	4300	4600
2	17.4	7600	1.20	7400	7800
3	22.5	9500	1.20	9300	9700
4	31.3	12200	1.20	11600	13400
8	45.4	18700	1.21	17600	19200
12	57.6	23000	1.22	21800	24200
16	64.9	25600	1.22	23900	27200
20	71.6	28300	1.24	27500	30000
24	76.6	31200	1.24	29200	32100

Notes: (a) The experimental Mn and the Đ measured by GPC using PEG standard (b) Theoretical calculated value (c) The experimental Mn was calculated from ^{1}H NMR spectra of the polymerization mixture in D_2O.

Table S3. Parameters of PSS via Ru-complex catalyzed photopolymerizations and the ECL intensity

Sample	CETP/SSS	Conversion[c] (%)	Mn[b]	Mn[a]	PDI[b]	ECL intensity
1	1:50	59.2	6500	6800	1.21	1519
2	1:100	64.2	13700	12500	1.22	2020
3	1:150	66.3	21000	20100	1.24	2406
4	1:200	76.6	32100	31200	1.23	2913
5	1:250	71.2	37200	35400	1.24	3149
6	1:300	73.8	46120	42800	1.24	3276
7	1:350	76.2	55000	53200	1.22	3356
8	1:400	75.2	62500	58200	1.24	3532

(a) Theoretical calculated value (b) The experimental Mn and the PDI measured by GPC using PEG standard (c) The experimental conversion was calculated from ^{1}H NMR spectra of the polymerization mixture in D_2O.

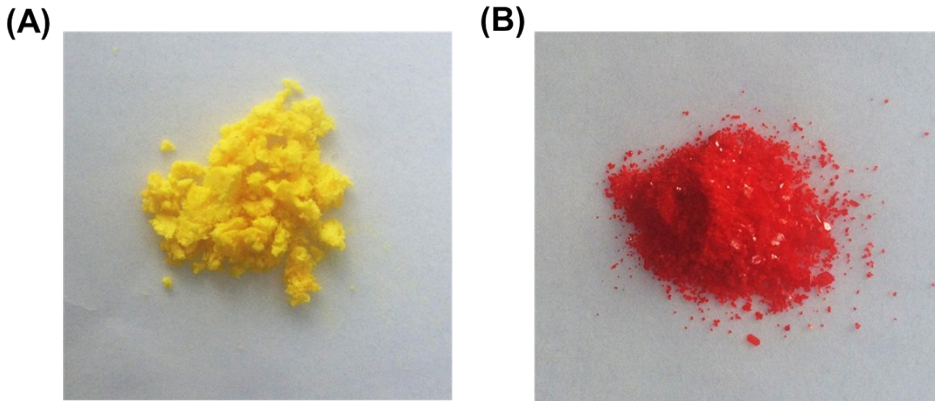


Figure S1. Photogrphs of (A) PCETP and (B) $Ru(bpy)_3Cl_2·6H2O$

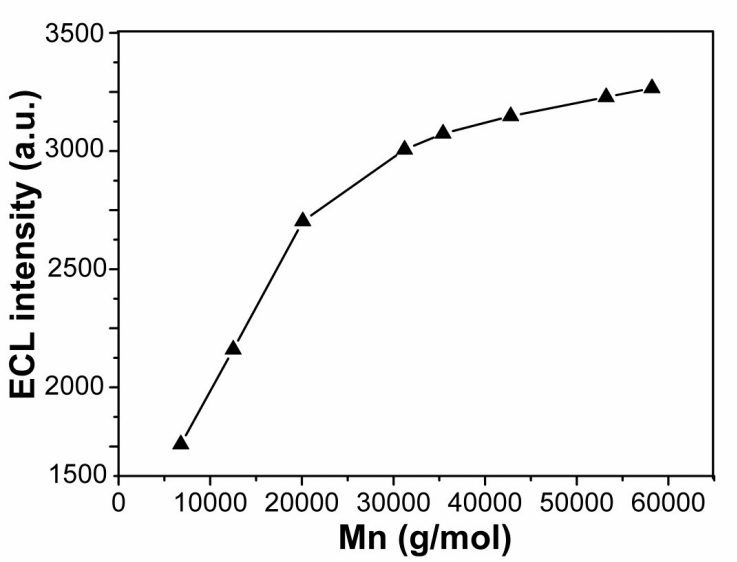
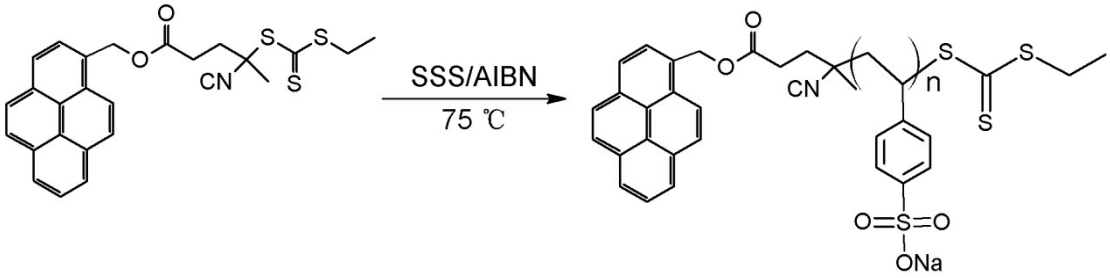


Figure S2. ECL intensity versus different Mn of PSS

RAFT polymerization of PSS

The PCETP (23.9 mg, 5.0×10^{-2} mmol), SSS (2.06 g, 10 mmol) and AIBN (2.8 mg, 1.7×10^{-2} mmol) were dissolved in the mixture of 1, 4-dioxane (3.5 mL) and ultrapure water (3.5 mL) in a round-bottom flask. The resulting mixture was deoxygenated for 30 min using highly pure nitrogen, followed by the stirring at 75 °C for 10 h in a preheated oil bath. The obtained PSS was purified by dialyzing in ultrapure water for 3 days before vacuum drying.



Scheme S1. RAFT polymerization process of PSS