Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supplementary Information

New Journal of Chemistry

Fabrication of polymer capsules by an original multifunctional active amphiphilic macromolecule and its application in PCMs microcapsules

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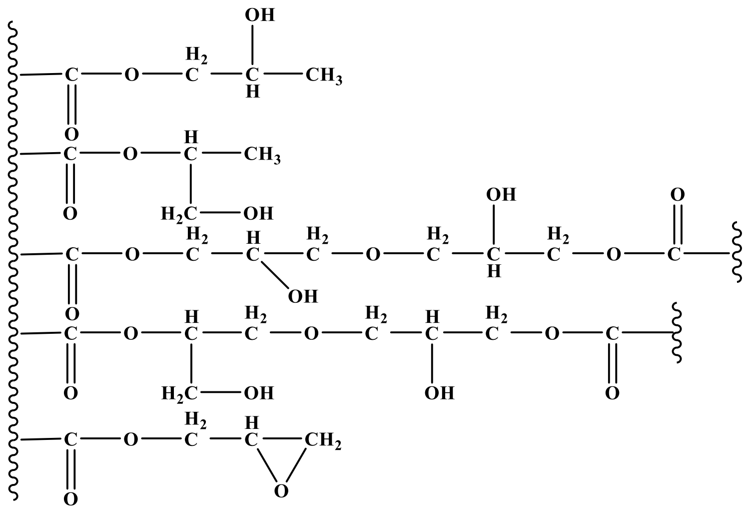
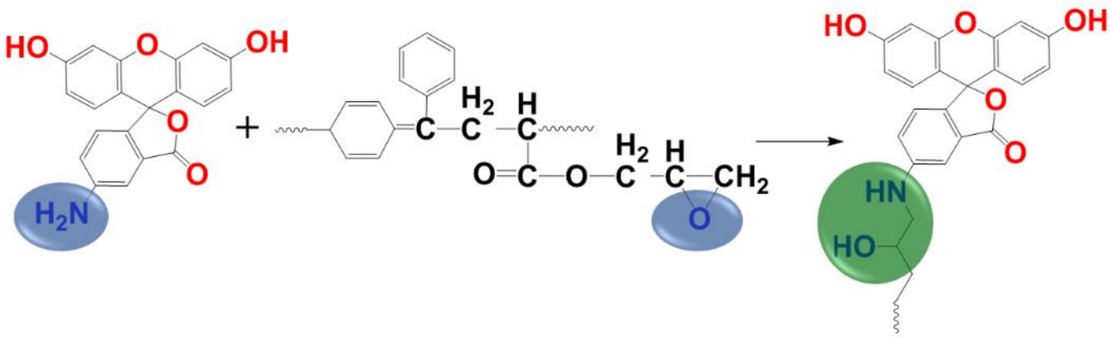


Figure S1 Structural formula of hydrolyzed D-PGMA.

Figure S2 Emulsion of MMA monomer droplets emulsified by D-PGMA.



Scheme S1 Scheme for the preparation of 5-amino fluorescein tagged D-PGMA.

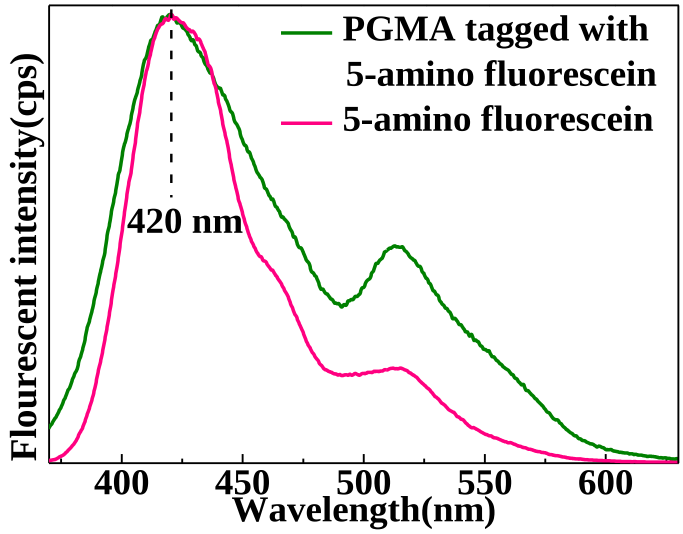


Figure S3 Fluorescence spectra of 5-amino fluorescein and D-PGMA tagged with 5-amino fluorescein.

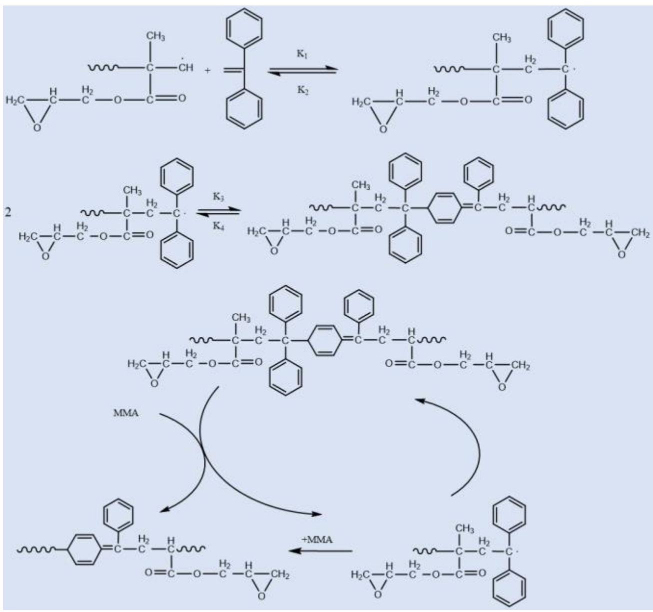


Figure S4 The mechanism of DPE controlled radical polymerization.

Table S1 Detailed recipes for the preparation of microcapsules and PCMs microcapsules.

Sample	MMA (g)	1-octadecane (g)	D-PGMA (g)	Water (ml)
1	14.00	/	28.00	158
4	14.00	14.00	14.00	158

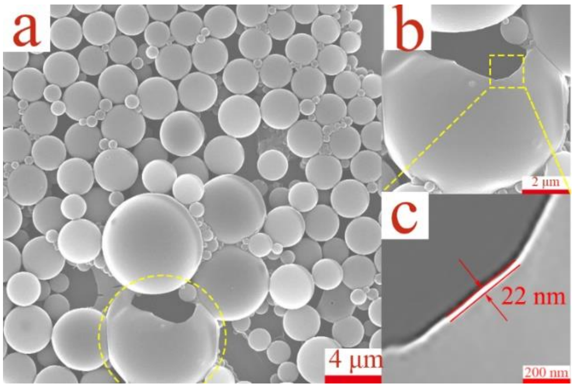


Figure S5 SEM images of P(D-PGMA-MMA) capsules prepared with a mass ratio of D-PGMA/MMA=7%/14%.

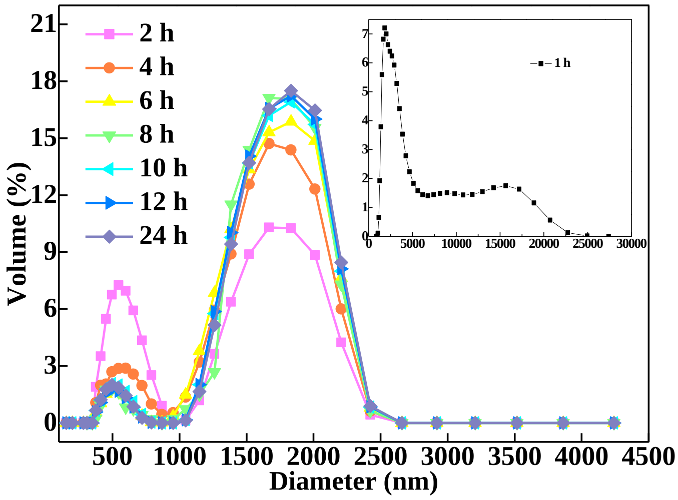


Figure S6 Size distributions of P(D-PGMA-MMA) particles at different times.

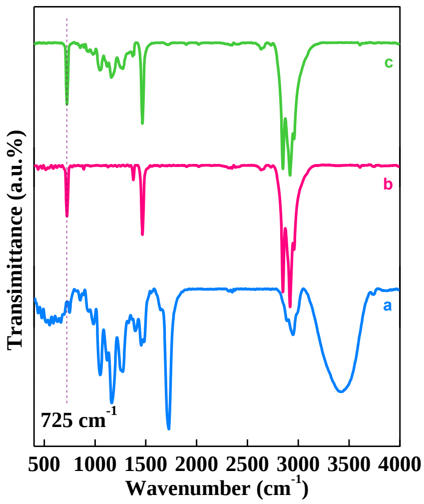


Figure S7 FT-IR spectra of different polymers. Figure S6: (a) P(D-PGMA-MMA); (b) pure 1-octadecane; (c)1-octadecane@P(D-PGMA-MMA).

Table S2 Encapsulation ratio of different PCMs microcapsules.

No.	Shell materials	Core materials	Method of encapsulation	Encapsul-ation ratio	Literature
1	P(ODMA-MAA)	n-octadecane	Suspension-like polymerization	42%	*Energy*, 2014, 68, 160
2	Calcium carbonate	Paraffin wax	Self-assembly method	59.4%	*Appl.* Energy, 2016, 171, 113
3	High density polyethylene	Paraffin wax	Situ polymerization	43%	*Energy Convers. Manage*., 2014, 87, 400
4	Cross linked PMMA	RubithermsRT21	Suspension polymerization	85.6%	*Sol. Energy Mater. Sol. Cells*, 2015, 132, 311
5	Cross linked PMMA	n-hexadecane	Emulsion polymerization	61.4%	*Thermochim. Acta*, 2011, 518, 1
6	Cross linked PMMA	n-octadecane	Suspension polymerization	75.3%	*Sol. Energy Mater. Sol. Cells*, 2012, 98, 283
7	P(MMA-co-MA-co-MAA)	PRS paraffin wax	Suspension polymerization	41.7%	*Ind. Eng. Chem. Res.*, 2010, 49, 12204
8	P(St-MMA)	PRS paraffin wax	suspension polymerization	43.2%	*Chem. Eng. J.*, 2010, 157, 216
9	PMMA	Paraffin	UV irradiation	61.2%	*Sol. Energy Mater. Sol. Cells*, 2010, 94, 1643
10	PMMA	paraffin wax	UV irradiation	66%	*Mater. Chem. Phys*., 2012, 135, 181
11	PMMA-Silica Hybrid Shell	n-octadecane	Sol–Gel Process	73.3%	*J. Appl. Polym. Sci.*, 2009, 112, 1850
12	Modified PMMA	(Na_2HPO_4 $7H_2O$) Hydrate Salt	Suspension copolymerization-solvent volatile	84%	*Thermochim. Acta*, 2013, 557, 1
13	LDPE-EVA copolymer	RubithermsRT27	Spry drying	63%	*Colloid Polym. Sci*., 2011, 289, 169
14	Polyurea	n-octadecane	Interfacial polymerization	83%	*Engineering Aspects*, 2013, 422, 61