Electronic supplementary information

The actual centrifugal acceleration (*a*) was calculated according to formula S (1) and S (2)

$$a = r \times \omega^2 \quad (S1)$$

$$\omega = \frac{2\pi N}{60} rad/s \quad (S2)$$

where *r* is the mean inner diameter of the casing (75 mm), and N is the rotational speed (rpm).

When N is 600 rpm, 900 rpm, 1200 rpm, 1500 rpm and 1800 rpm respectively, the corresponding *a* is 295.8 m/s^2, 665.5 m/s^2,1183.2 m/s^2,1848.7 m/s^2, and 2662.1 m/s^2, respectively.

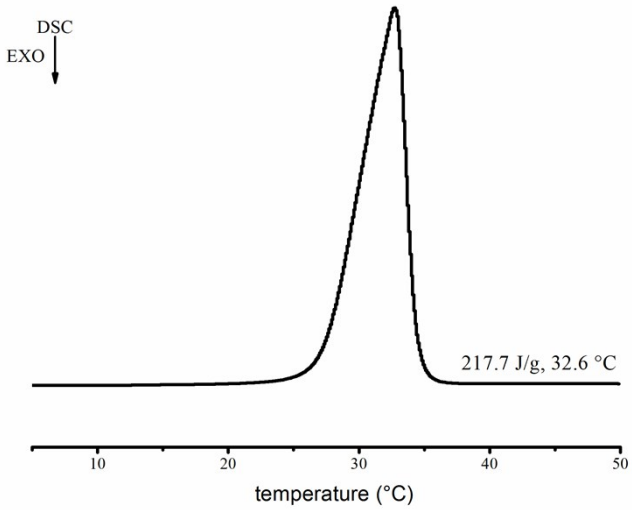

Figure S1 DSC curve of PCM

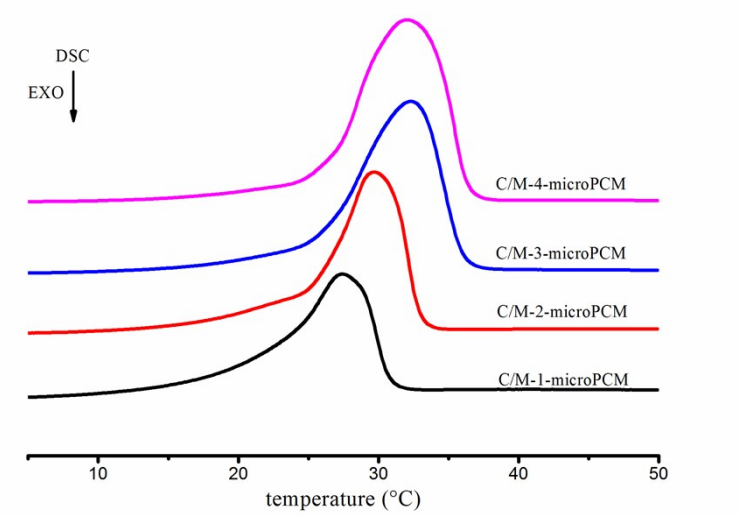

Figure S2 DSC curves of microPCMs with different C/M

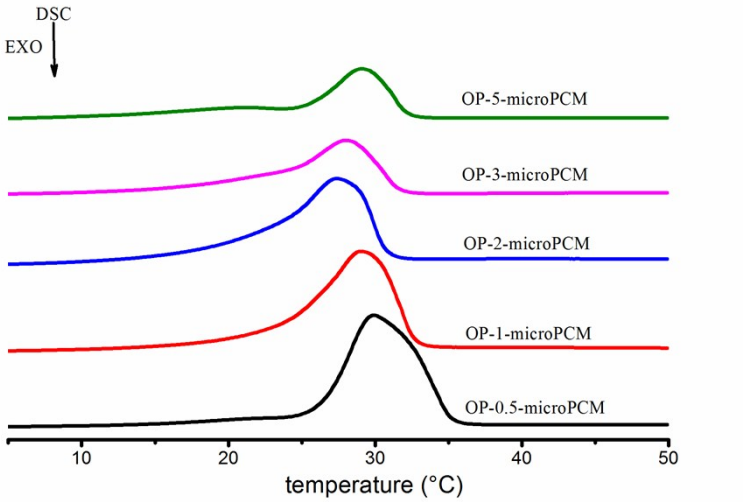

Figure S3 DSC curves of microPCMs with different emulsifier dosage

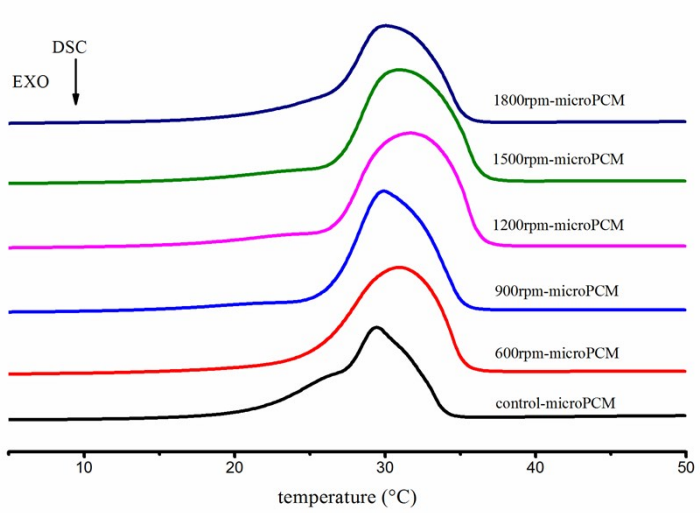

Figure S4 DSC curves of control microPCM and microPCMs prepared at different N in RPB

Table S1 comparison between RPB and other reactors in microencapsulation of PCMs

Reactors	Shell materials	PCMs	Preparation time (min)	Reaction temperature (℃)	Highest ΔH_{fus} (J/g)	Highest C_a/E %	Morphology of microcapsules	References
RPB	Polyurea	Paraffin	6	25	105.59	48.5/97	Compact and smooth surfaces	This work
500ml beaker with a mechanical stirrer	Polyurea	Paraffin	60	25	84.5	38.8/77.6	rough surfaces	This work
round-bottom flask with a QSL high-speed disperse-machine	polyurea	paraffin	240	60	92.5	44.5/-	spherical shape with a coarse surface	(2016)[1]
a beaker with a magnetic stirrer	Polyurea	n-octadecane	150	35℃-30min 55℃-120min	170.4	-/99.6	spherical and the surface is dented	(2015)[2]
a 250 ml three-neck round-bottomed flask with a mechanical stirrer	polyurea/polyurethane	butyl stearate and paraffin	180	60	82.62	60/-	relatively spherical profiles and compact surfaces	(2013)[3]
conventional reactor with a mechanical stirrer	polyurea	n-octadecane	180	50	54.9	23.7/-	many microcapsules were damaged	(2012)[4]
500-mL beaker with a mechanical stirrer	Polyurea/polyureathane	butyl stearate	255	70	85	-/95	smooth and compact surface	(2011)[5]
250-mL beaker with a high shear mechanical stirrer consisting of a mesh plate encasing the stirrer blades	polyurea	n-octadecane	90	60	-	70/92	round and regular	(2007)[6]
conventional reactor with a mechanical stirrer	polyurea	octadecane	120	25	117.5	-/94.7	Smooth and regular	(2006)[7]

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