

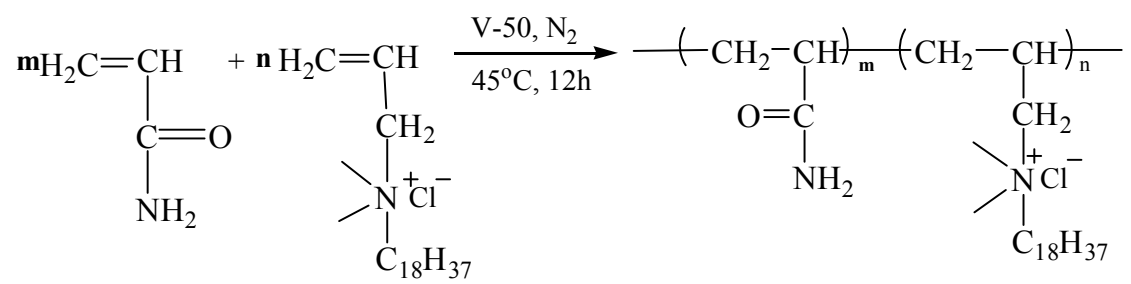
**Endowing Cationic Hydrophobic Associating Polyacrylamide Solution CO<sub>2</sub> Switchable Property with N, N-dimethylamidopropylamine via the Assembly Transition between Vesicles and Spherical Micelles by CO<sub>2</sub>**

Hongsheng Lu, <sup>\*a</sup> Cunchuan Zheng, <sup>a</sup> Li Wang, <sup>b</sup> Ya Liu,<sup>a</sup> and Zhiyu Huang <sup>a</sup>

*a College of Chemistry and Chemical Engineering, Southwest Petroleum University,  
Chengdu 610500, P. R. China*

*b Sichuan Institute of Fine Chemical Industry Research and Design, Chengdu 610500,  
P. R. China*

\*Corresponding authors. Email: hshlu@swpu.edu.cn; Fax: +86-28-83037330; Tel:  
+86-28-83037330.



Scheme S1 Synthesis route of hydrophobic associating copolymer PAD

Table S1 Results of molecular weight of copolymer PAD

Sample	Mass (g) DOAPA	Mass (g) AM	Feed Ratio of DOAPA(mol%)	Yield (%)	$M_\eta$	$M_w$	$M_n$
PAD	0.52	19.48	0.50	80.10	230221	569964	137676

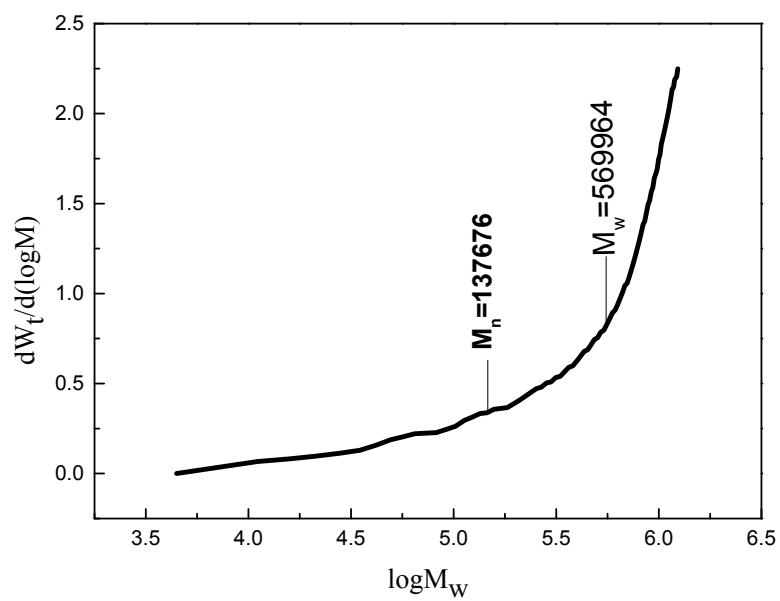


Figure S1 molecular weight of copolymer PAD

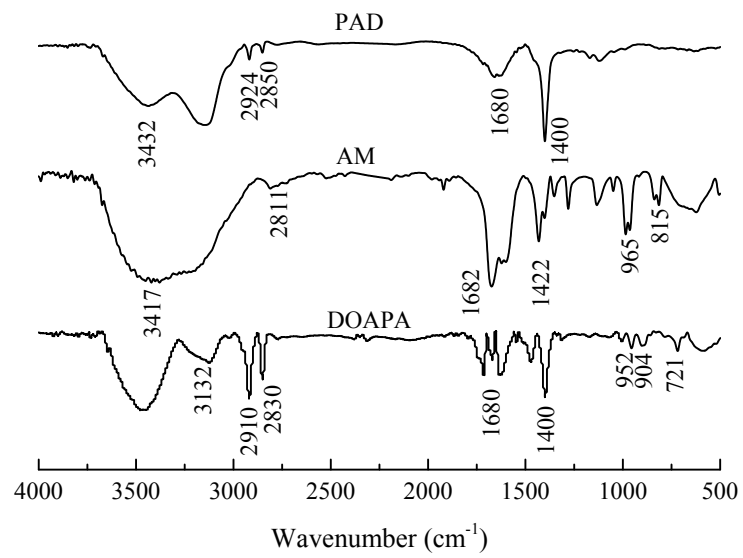


Figure S2 IR spectrum of monomers and copolymers

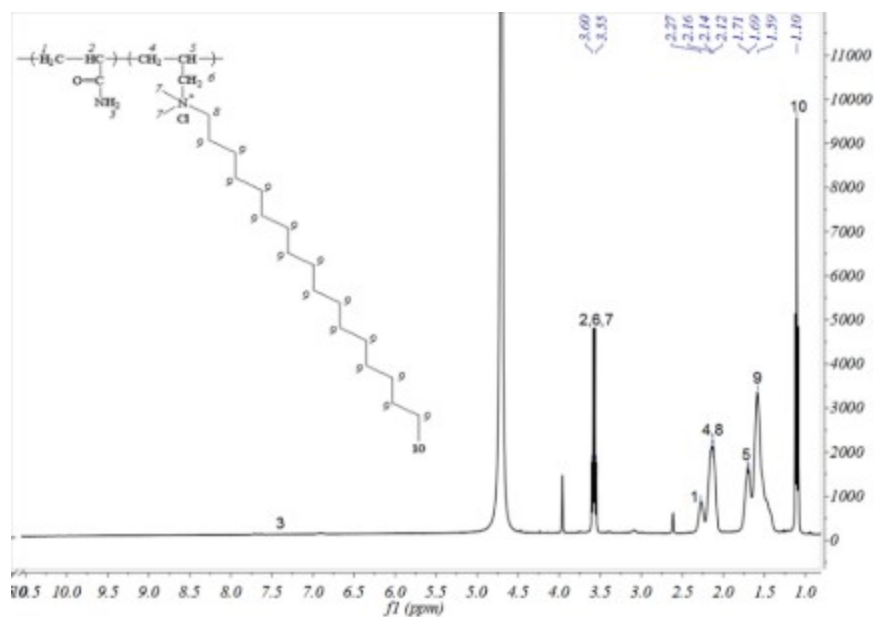


Figure S3  $^1\text{H}$  NMR of hydrophobic associating polymer PAD

$^1\text{H}$ -NMR (400 MHz,  $\text{D}_2\text{O}$ ): 1.10(3H, alkyl  $-\text{CH}_3$ ), 1.59(32H, alkyl  $-\text{CH}_2$ ), 2.12(2H,  $\alpha\text{-CH}_2$  to  $\text{N}^+$ ), 2.27(2H,  $-\text{CH}_2\text{-CH-}$ ) 3.55(6H,  $-\text{CH}_3$  to  $\text{N}^+$ ; 2H,  $-\text{CH}_2$  to  $\text{N}^+$ ), 3.60 (1H,  $-\text{CH-C=O}$ ), 7.30 (2H,  $-\text{NH}_2$ )

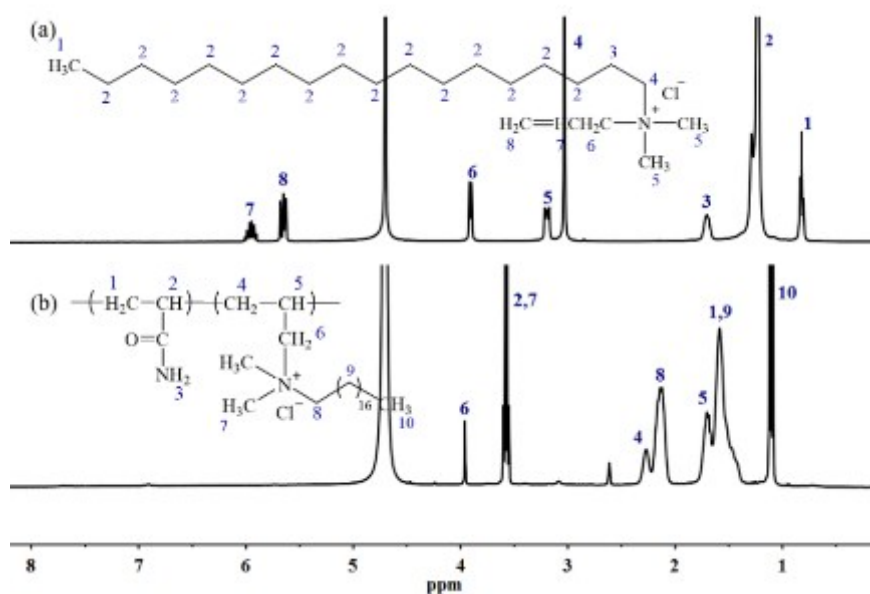


Figure S4  $^1\text{H}$  NMR of (a) hydrophobic monomer DOAPA and (b) copolymer PAD

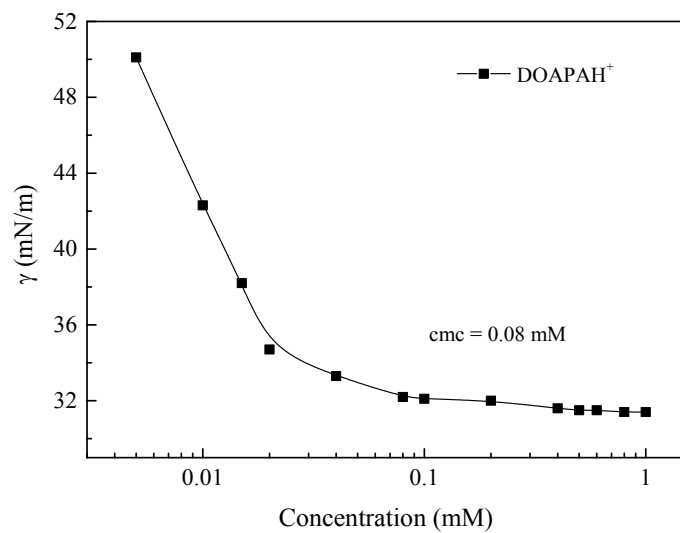


Figure S5 Surface tension vs logC plots for DOAPAH<sup>+</sup> at 25 °C

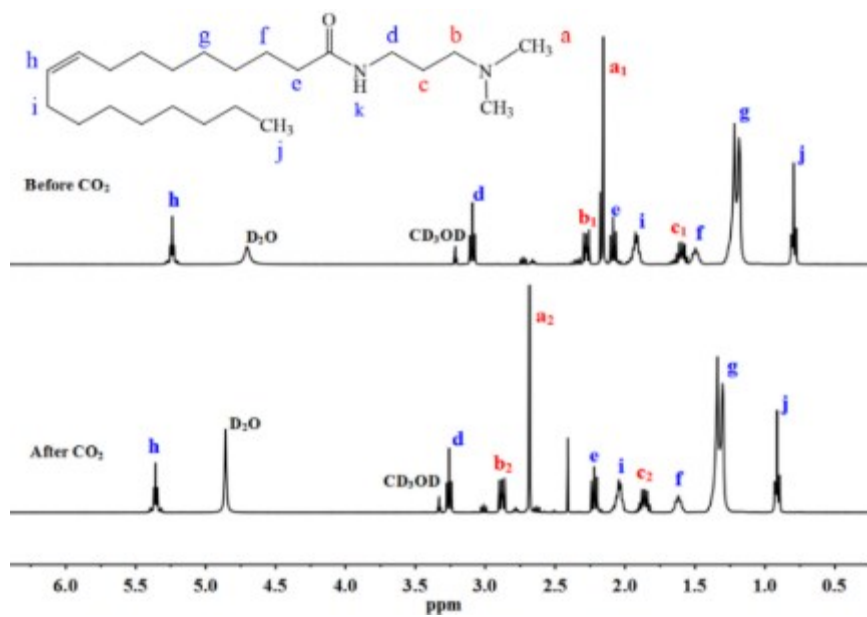


Figure S6  $^1\text{H-NMR}$  spectra of the DOAPA aqueous before and after bubbling of  $\text{CO}_2$  using  $\text{CD}_3\text{OD}/\text{D}_2\text{O}$  (v/v=5:1) as a solvent.