

## Controllable self-growth of hydrogel with multiple membranes

Pengyao Xing, Xiaoxiao Chu, Guangyan Du, Mingzhi Li, Jie Su, Aiyu Hao,\* Yuehui Hou, Shangyang Li, Mingfang Ma, Le Wu, Qiubing Yu

*School of Chemistry and Chemical Engineering and Key Laboratory of Colloid and Interface Chemistry of Ministry of Education, Shandong University, Jinan 250100, PR China.*

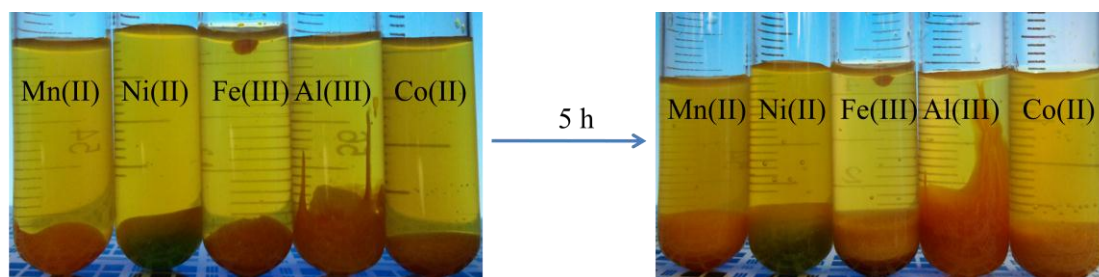


Figure S1. The growing behaviors of different TMIs,  $M_{\text{salts}} = 2 \text{ mmol}$ ,  $C_{\text{FA}} = 20 \text{ mM}$ , RT.

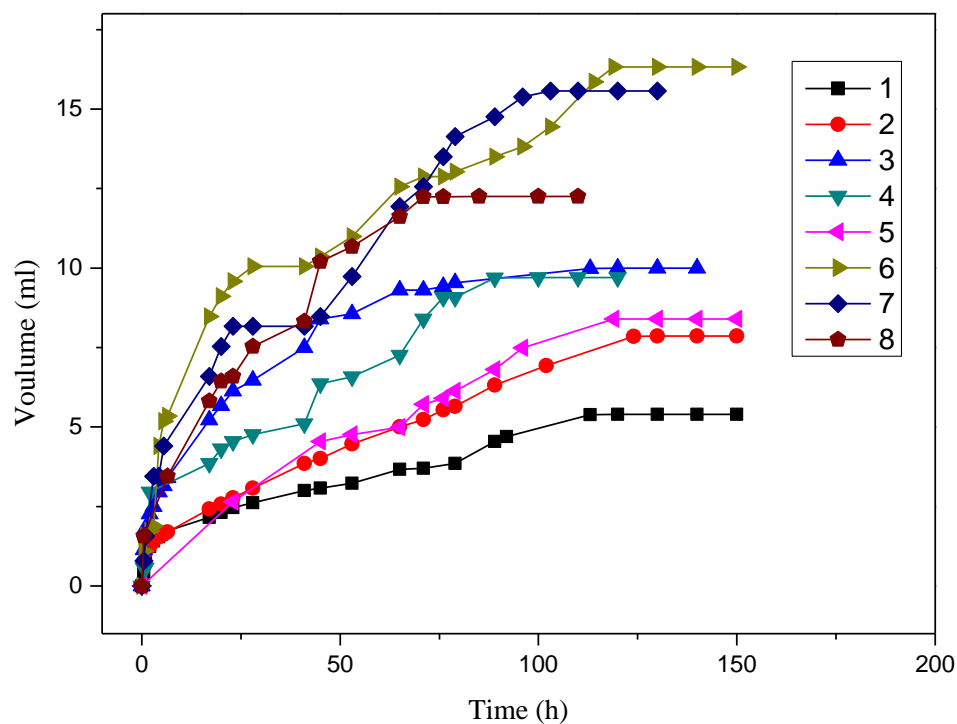


Figure S2. The growing courses of hydrogel under different concentration conditions with time changes which is listed in Table S1.

Concentrations of different gel for Fig. S2

entry	C <sub>folate</sub> (mM)	M <sub>ZnCl2</sub> (g)
1	10	0.02
2	20	0.05
3	20	0.1
4	40	0.1
5	60	0.1
6	20	0.2
7	40	0.2
8	60	0.2

Table S1 Results of different metal ions as the hydrogel inducers.

Cations	State
Zn <sup>II</sup>	Gel
Cu <sup>II</sup>	Gel
Ba <sup>II</sup>	Precipitate
Mn <sup>II</sup>	Gel
Cd <sup>II</sup>	Gel
Fe <sup>III</sup>	Gel
Co <sup>II</sup>	Gel
NH <sub>4</sub> <sup>+</sup>	Solution
Al <sup>III</sup>	Gel
Ni <sup>II</sup>	Gel
Mg <sup>II</sup>	Precipitate

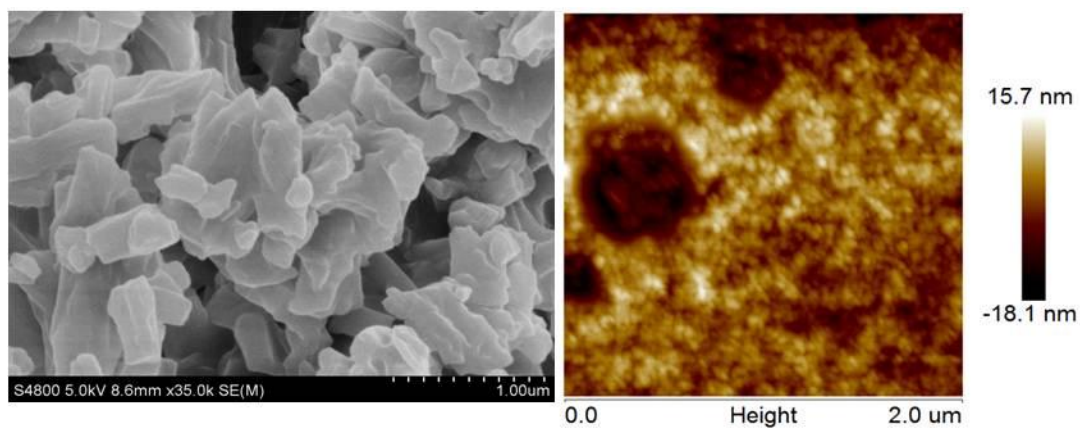


Figure S3 Images of FA solution without adding TMIs under SEM, AFM observations, respectively,  $C_{FA}=60$  mmol/L, dried under vacuum conditions.

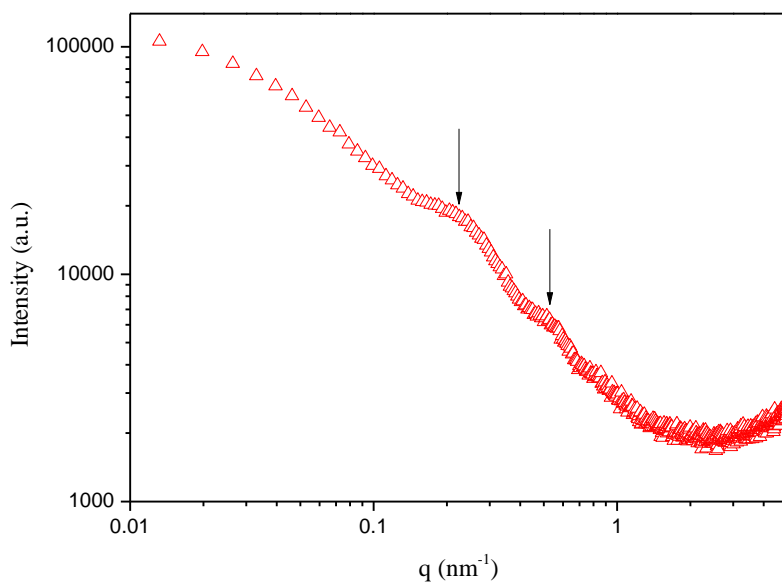


Figure S4 Small-angle X-ray scattering (SAXS) pattern of gel,  $M_{salts}=2$  mmol,  $C_{FA}=20$  mM, RT.