

Electronic Supplementary Information

**Strategy of fabrication of controlled thermosetting gel based on soybean oil  
towards supercritical carbon dioxide foaming**

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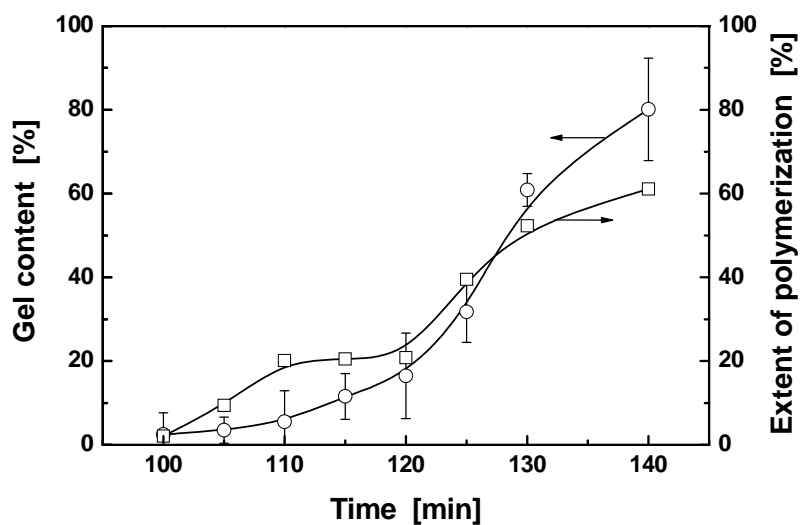
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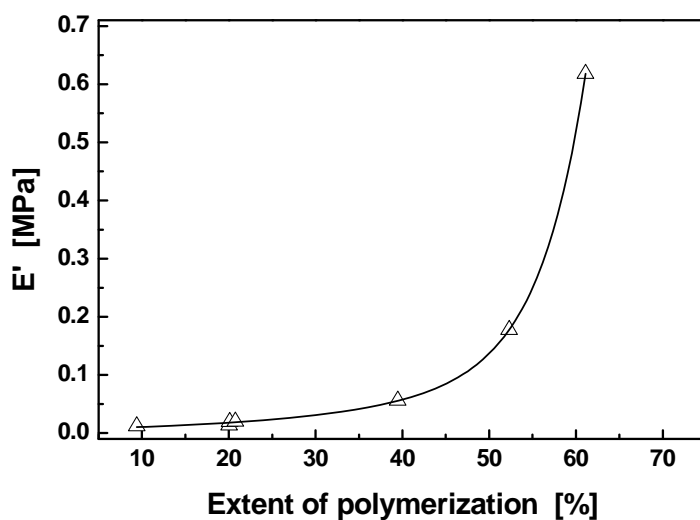
**Table S1.** Creation of an orthographic factorial design of eight factors and ten levels  
for preparation of AESO/St gel

Level	Factor							$\Delta T^*$ (°C)
	AESO (g)	St (ml)	T (°C)	CP (ml)	CoOct (ml)	DTBP (ml)	Gel time (min)	
1	22.5	2.75	51	0.15	0.10	0.8	No reaction within 48 h	0
2	21.25	4.12	60	0.35	0	0.6	No reaction within 38 h	0
3	20	5.49	69	0	0.12	0.4	No reaction within 36 h	0
4	18.75	6.87	45	0.2	0.02	0.2	900	0
5	17.5	8.24	54	0.4	0.14	0	55	38
6	16.25	9.62	63	0.05	0.04	0.9	No reaction within 24 h	0
7	15	10.99	72	0.25	0.16	0.7	32	0
8	13.75	12.36	48	0.45	0.06	0.5	70	13
9	12.5	13.74	57	0.10	0.18	0.3	No reaction within 24 h	0
10	11.25	15.22	66	0.30	0.08	0.1	22	65

\*  $\Delta T$  represents the temperature rise during the polymerization. Multiple regression and multi-objective optimization were carried out on the basis of Table S1 (target parameters:  $\Delta T = 0$ , gel time = 2 h). It was found that stable gel can be obtained under 54 °C when AESO = 20 g, St = 8.3 ml, CP = 0.35 ml, DTBP = 0.3 ml, CoOct = 0.15 ml (i.e. AESO/St (w/w=7:3); CP/DTBP/CoOct (v/v/w=3.5/3/0.002)).



**Figure S1.** Gel content and extent of polymerization of AESO/St with CP/DTBP/CoOct initiator as a function of reaction time. Compositions: AESO/St (w/w=7:3), CP/DTBP/CoOct (v/v/w=3.5/3/0.002). Reaction temperature: 54 °C.



**Figure S2.** Dependence of storage modulus on extent of polymerization of AESO/St gel.