gels

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Article

Facile Fabrication of Transparent and Opaque Albumin Methacryloyl Gels with Highly Improved Mechanical Properties and Controlled Pore Structures

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Supplementary Materials:

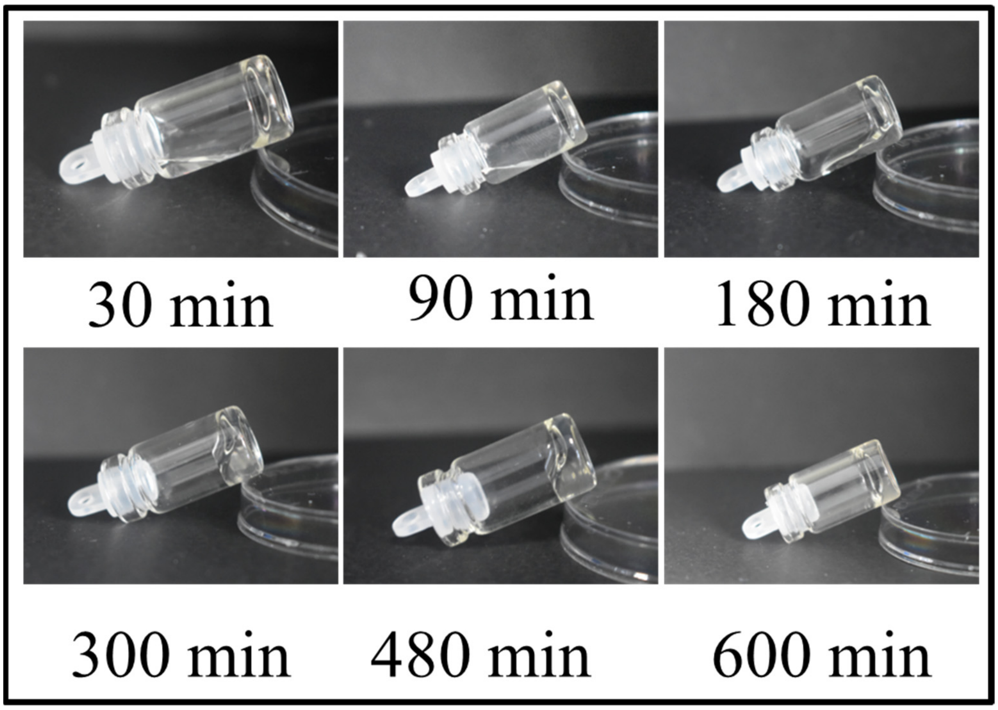


Figure S1. The RT sol-gel transition of 10% BSAMA as evaluated by a tilt-tube test under free radical polymerization at determined time points.

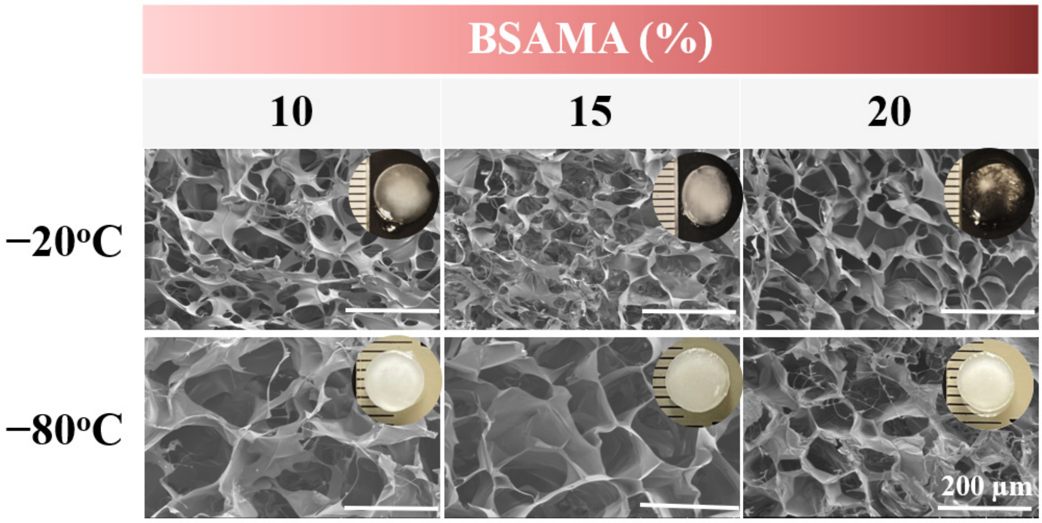
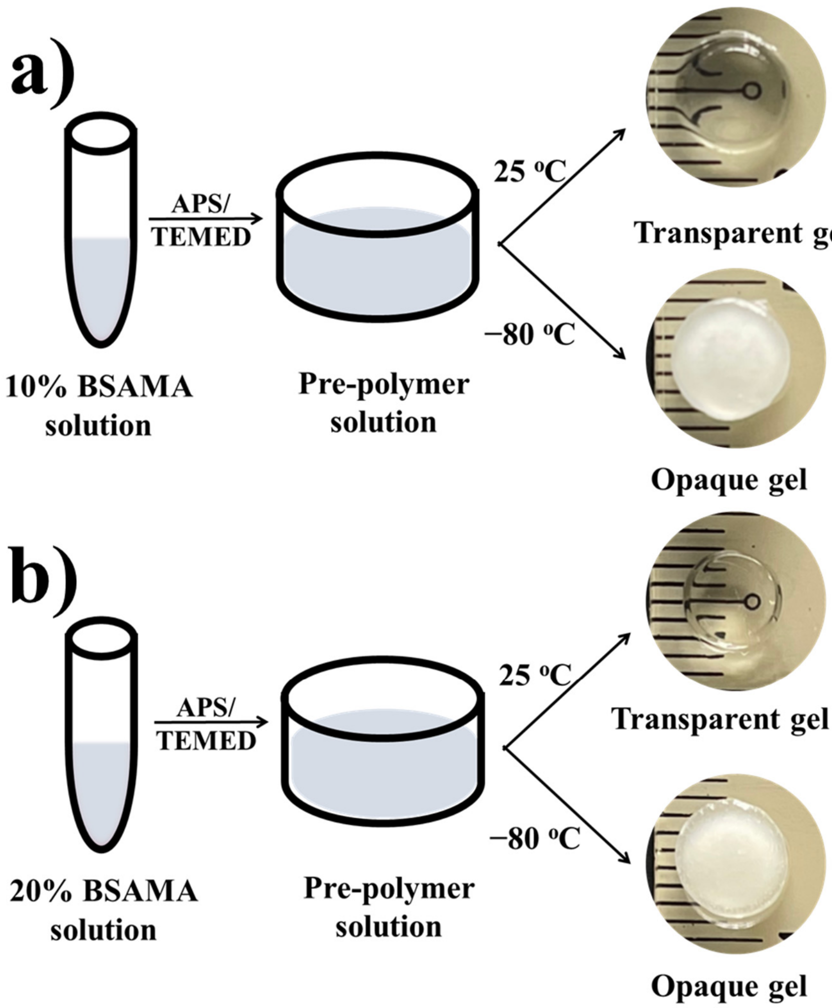


Figure S2. Optimization of cryogelation temperature. Representative SEM images of the gels obtained at −20 and −80 °C by using 10, 15, and 20% BSAMA concentrations. Insets in the images show the optical images of the as-obtained cryogels after thawing.



Scheme S1. Photographs of the transparent and opaque BSAMA gels as prepared by using 10% (a) and 20% (b) BSAMA solutions by free radical polymerization under different temperatures.

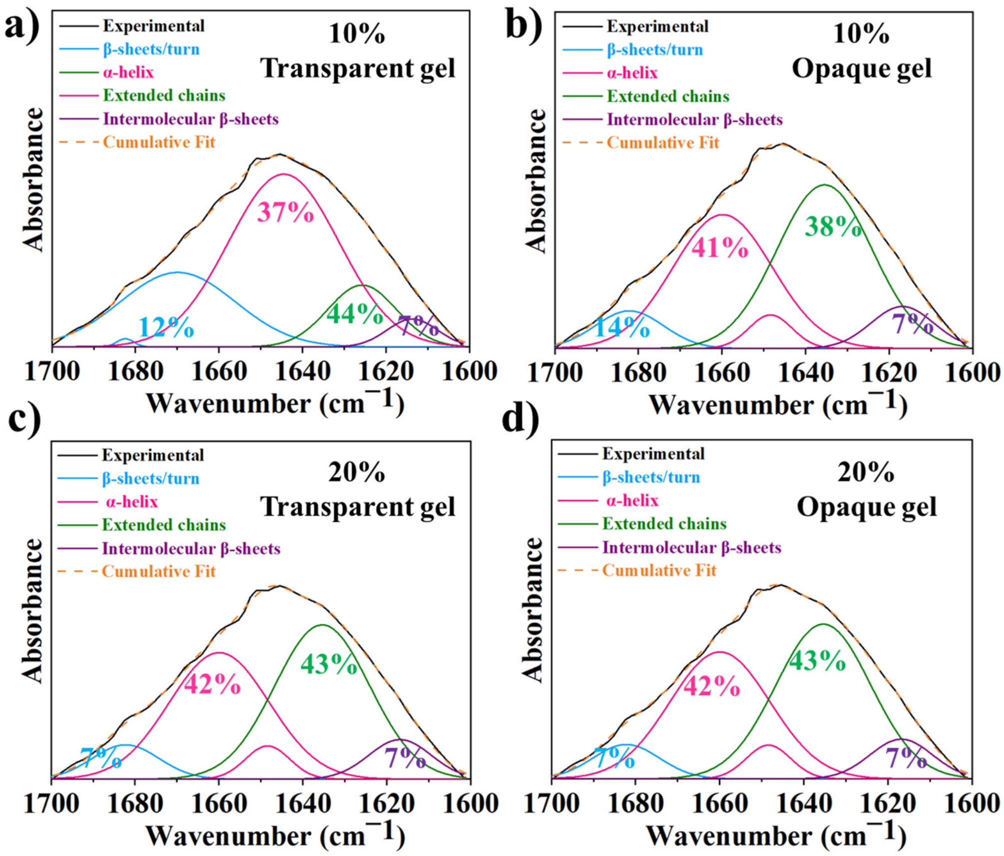


Figure S3. Normalized ATR-FTIR spectra of 10% BSAMA-based (**a**) transparent, (**b**) opaque gels, and 20% BSAMA based (**c**) transparent and d) opaque gels.

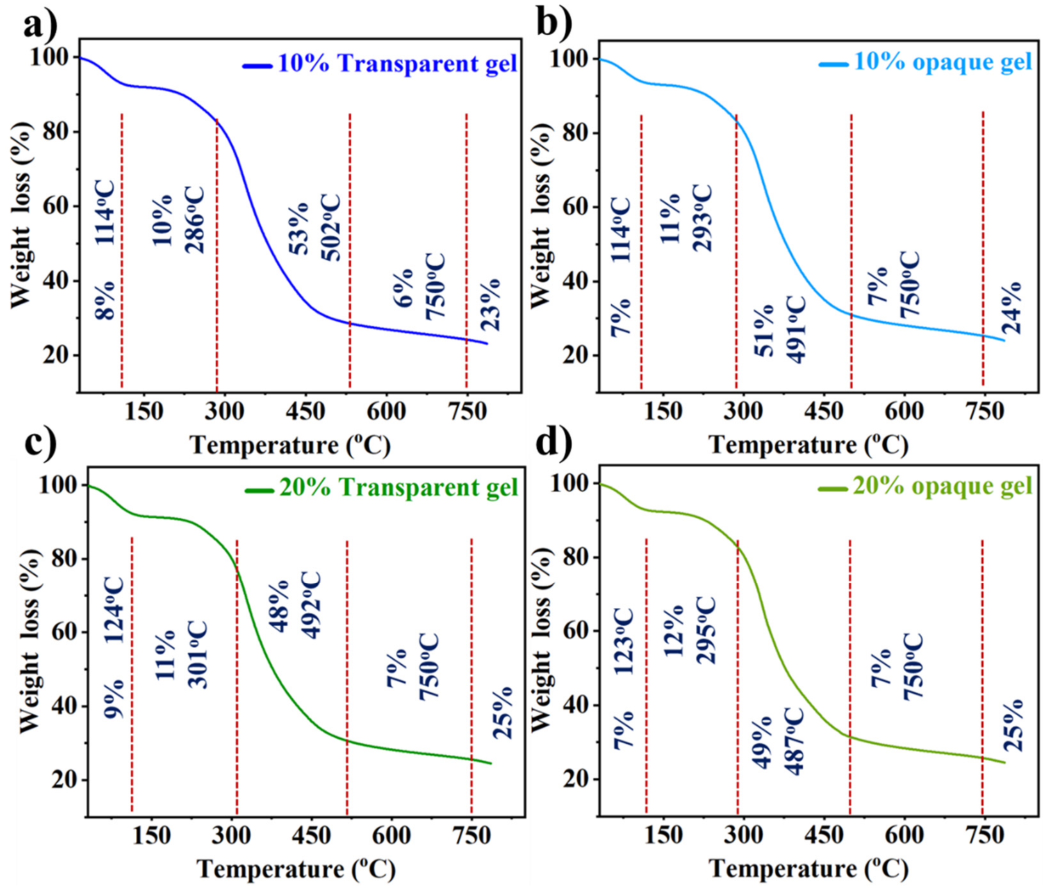


Figure S4. TGA curve of BSAMA (10% (w/v))-based (**a**) transparent and (**b**) opaque gels, and BSAMA (20% (w/v))-based c) transparent and d) opaque gels.

Table S1. Enzymatic degradation of BSAMA gels prepared at RT and −80 °C by using Proteinase K.

10% RT-Transparent gel								
Time (min)	**Weight (mg)**	**Weight (mg) (3 replicate samples)**			**Residual rate (%) = W_t/W_0*100**			**Av. Residual rate (%)**
		W_1	W_2	W_3	D_1	D_2	D_3	$= (D_1 + D_2 + D_3)/3$
0	W_0	134.90	134.0	133.0	100	100	100	100
10	W_{10}	126.2	123.6	128.7	93.55	92.24	96.77	94.19
20	W_{20}	119.9	112.1	117.6	88.88	83.66	88.42	86.99
30	W_{30}	87.8	88.4	87.7	65.09	65.97	65.94	65.67
40	W_{40}	59.9	66.7	69.8	44.40	49.78	52.48	48.89
50	W_{50}	35.9	43.3	45.8	26.61	32.31	34.44	31.12
60	W_{60}	25.4	31.5	35.7	18.83	23.51	26.84	23.06
120	W_{120}	0	0	0	0	0	0	0
180	W_{180}							
240	W_{240}							
300	W_{300}							
10% −80-Opaque gel								
Time (min)	**Weight (mg)**	**Weight (mg) (3 replicate samples)**			**Residual rate (%) = W_t/W_0*100**			**Av. Residual rate (%)**
		W_1	W_2	W_3	D_1	D_2	D_3	$= (D_1 + D_2 + D_3)/3$
0	W_0	129.3	131.6	130.8	100	100	100	100
10	W_{10}	124.5	127.8	123.9	96.29	97.11	94.72	96.04
20	W_{20}	120.4	123.0	117.9	93.12	93.46	90.14	92.24
30	W_{30}	104.8	108.8	106.1	81.05	82.67	81.12	81.61
40	W_{40}	96.6	103.9	103.1	74.71	78.95	78.82	77.49
50	W_{50}	81.8	88.9	91.9	63.26	67.55	70.26	67.03
60	W_{60}	74.1	71.8	80.7	57.31	54.56	61.69	57.85
120	W_{120}	48.1	53.7	55.6	37.20	40.81	42.51	40.17
180	W_{180}	32.6	40.1	34.3	25.21	30.47	26.22	27.30
240	W_{240}	24.0	26.3	22.1	18.56	19.98	16.89	18.48
300	W_{300}	16.8	16.2	13.1	12.99	12.31	10.01	11.77
15% RT-Transparent gel								
Time (min)	**Weight (mg)**	**Weight (mg) (3 replicate samples)**			**Residual rate (%) = W_t/W_0*100**			**Av. Residual rate (%)**
		W_1	W_2	W_3	D_1	D_2	D_3	$= (D_1 + D_2 + D_3)/3$
0	W_0	90.6	91.9	89.2	100	100	100	100
10	W_{10}	83.3	80.4	79.1	91.94	87.48	88.67	89.37
20	W_{20}	75.3	72.8	71.1	83.12	79.21	79.71	80.68
30	W_{30}	67.7	66.9	65.8	74.72	72.79	73.76	73.76
40	W_{40}	62.3	61.3	60.8	68.76	66.70	68.16	67.87
50	W_{50}	53.9	55.8	54.0	59.49	60.72	60.54	60.25
60	W_{60}	49.1	50.6	48.3	54.19	55.06	54.15	54.46
120	W_{120}	37.6	38.9	37.1	41.50	42.33	41.59	41.81
180	W_{180}	29.2	33.9	30.2	32.23	36.88	33.85	34.32
240	W_{240}	15.3	17.3	15.7	16.88	18.82	17.60	17.77
300	W_{300}	0	0	0	0	0	0	0
15% −80-Opaque gel								
Time (min)	**Weight (mg)**	**Weight (mg) (3 replicate samples)**			**Residual rate (%) = W_t/W_0*100**			**Av. Residual rate (%)**

		W_1	W_2	W_3	D_1	D_2	D_3	$= (D_1 + D_2 + D_3)/3$
0	W_0	133	138.5	137.1	100	100	100	100
10	W_{10}	124.4	125.8	123.7	93.53	90.83	90.23	91.53
20	W_{20}	118.1	119.4	117.5	88.79	86.21	85.70	86.90
30	W_{30}	114.2	115.5	113.9	85.86	83.39	83.07	84.11
40	W_{40}	106.5	107	107.3	80.07	77.25	78.26	78.53
50	W_{50}	100.1	101.2	101.5	75.26	73.06	74.03	74.12
60	W_{60}	98.6	99	98.2	74.13	71.48	71.62	72.41
120	W_{120}	82.1	84.7	83.9	61.72	61.15	61.19	61.36
180	W_{180}	74.5	75.6	77.5	56.01	54.58	56.52	55.71
240	W_{240}	69.8	71.7	70.6	52.48	51.76	51.49	51.91
300	W_{300}	67.5	66.9	71.5	50.75	48.30	52.15	50.40

20% RT-Transparent gel

Time (min)	Weight (mg)	Weight (mg) (3 replicate samples)			Residual rate (%) = W_t/W_0*100			Av. Residual rate (%)
		W_1	W_2	W_3	D_1	D_2	D_3	$= (D_1 + D_2 + D_3)/3$
0	W_0	128.3	127.8	129.7	100	100	100	100
10	W_{10}	111.6	112.0	115.8	86.98	87.63	89.28	87.96
20	W_{20}	108.2	107.7	108.1	84.33	84.27	83.34	83.98
30	W_{30}	105.3	103.0	106.8	82.07	80.59	82.34	81.67
40	W_{40}	93.9	94.7	96.6	73.18	74.10	74.47	73.92
50	W_{50}	91.8	92.2	92.5	71.55	72.14	71.31	71.67
60	W_{60}	87.3	86.6	85.9	68.04	67.76	66.22	67.34
120	W_{120}	68.7	69.3	69.7	53.54	54.22	53.74	53.84
180	W_{180}	57.4	59.2	57.3	44.73	46.32	44.17	45.08
240	W_{240}	50.7	52.7	52.8	39.51	41.23	40.71	40.48
300	W_{300}	42.4	43.6	42.3	33.04	34.11	32.61	33.26

20% −80-Opaque gel

Time (min)	Weight (mg)	Weight (mg) (3 replicate samples)			Residual rate (%) = W_t/W_0*100			Av. Residual rate (%)
		W_1	W_2	W_3	D_1	D_2	D_3	$= (D_1 + D_2 + D_3)/3$
0	W_0	128.3	127.8	129.7	100	100	100	100
10	W_{10}	111.6	112.0	115.8	86.98	87.63	89.28	87.96
20	W_{20}	108.2	107.7	108.1	84.33	84.27	83.34	83.98
30	W_{30}	105.3	103.0	106.8	82.07	80.59	82.34	81.67
40	W_{40}	93.9	94.7	96.6	73.18	74.10	74.47	73.92
50	W_{50}	91.8	92.2	92.5	71.55	72.14	71.31	71.67
60	W_{60}	87.3	86.6	85.9	68.04	67.76	66.23	67.34
120	W_{120}	68.7	69.3	69.7	53.54	54.22	53.74	53.83
180	W_{180}	57.4	59.2	57.3	44.73	46.32	44.18	45.08
240	W_{240}	50.7	52.7	52.8	39.52	41.243	40.71	40.48
300	W_{300}	42.4	43.6	42.3	33.05	34.12	32.61	33.26