

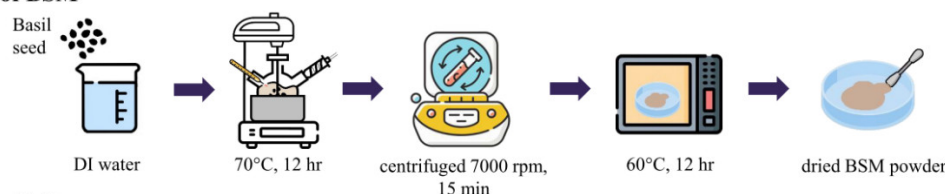
Article

Multi-Responsive Optimization of Novel pH-Sensitive Hydrogel Beads Based on Basil Seed Mucilage, Alginate, and Magnetic Particles

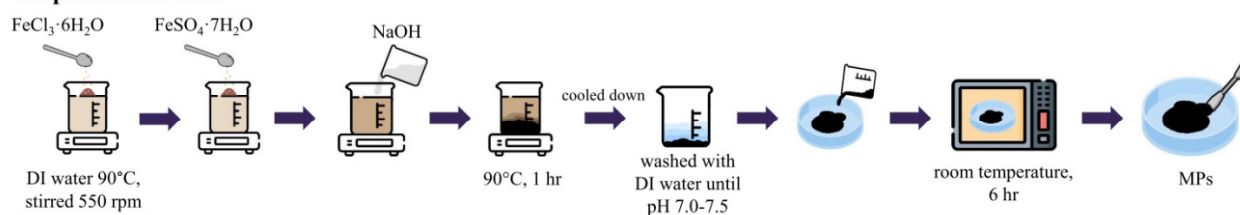
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Supplementary information

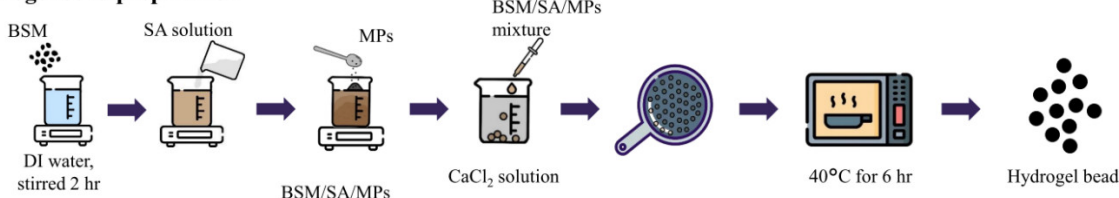
Preparation of BSM



Preparation of MPs



Hydrogel bead preparation



Scheme 1. Overall steps for hydrogel bead preparation.

Table S1. The properties for Grey relational coefficient calculation for the L16 comparability sequences.

Experimental design No.	Gray relational Coefficient				Drug loading	Swelling	Grey relational grade
	pH 1.2 drug release	pH 7.4 drug release	pH 1.2 antioxidant	pH 7.4 antioxidant			
1	0.896	0.353	0.605	0.390	0.334	0.436	0.502
2	0.877	0.339	0.666	0.342	0.334	0.413	0.495
3	1.000	0.402	0.333	0.403	0.334	0.751	0.537
4	0.947	0.366	0.833	0.970	0.334	0.636	0.681
5	0.527	0.333	0.700	0.401	0.334	0.333	0.438
6	0.397	0.354	0.889	0.337	0.334	0.400	0.452
7	0.444	0.601	0.310	0.519	0.334	1.000	0.535
8	0.477	0.369	0.627	0.356	0.334	0.806	0.495
9	0.538	0.343	0.699	0.415	0.334	0.343	0.445
10	0.458	0.366	0.314	0.409	0.334	0.549	0.405
11	0.478	0.476	0.527	0.333	0.333	0.389	0.423
12	0.403	0.358	0.509	0.429	0.334	0.458	0.415
13	0.402	0.363	0.521	0.376	0.334	0.511	0.418
14	0.439	0.472	0.416	0.632	0.334	0.640	0.489
15	0.383	0.354	0.451	0.345	0.334	0.448	0.386
16	0.333	1.000	1.000	1.000	0.333	0.556	0.704

Table S2. Sol fraction of the hydrogel beads.

Experimental design No.	Sol fraction (%)	SD
1	49.55	5.51
2	45.29	2.06
3	40.75	6.66
4	38.28	4.80
5	31.96	5.83
6	36.50	6.05
7	22.23	1.00
8	32.89	1.60
9	17.52	0.11
10	13.33	2.14
11	30.27	1.92
12	30.43	3.67
13	7.05	1.40
14	21.23	2.39
15	15.46	5.83
16	23.26	2.80

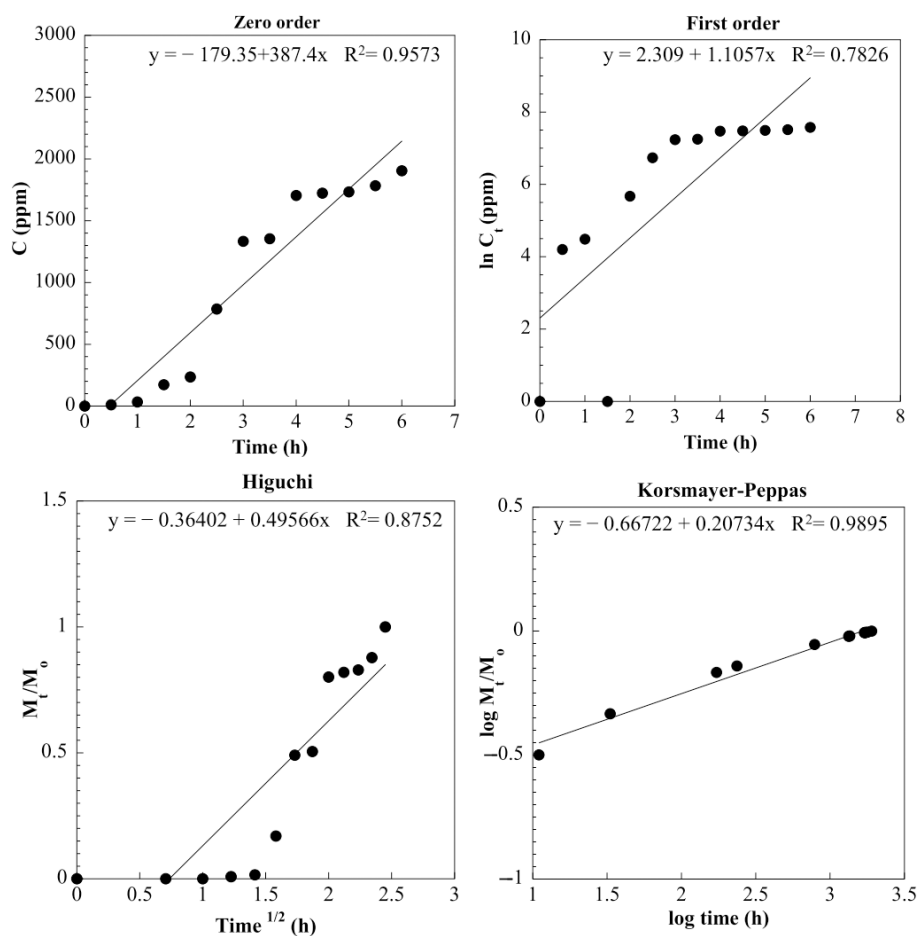


Figure S1. shows the release profiles obtained using the four mathematical models.