

Supplementary Materials

Composite Central Face Design – An Approach to Achieve Efficient Alginate Microcarriers

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Table S1 – CCF design matrix and responses of the MPs in terms of protein entrapment, release, swelling and sphericity

Run	Alginate (%)	CaCl ₂ (%)	Protein entrapment (%)	Release (after 24h)	Swelling (%)	Sphericity
1	4	10	74.4	70.8	-22	0.95
2	2.5	5.5	73.6	60.1	31	0.97
3	1	10	53	87.5	-4	0.84
4	2.5	5.5	76.7	67.1	22	0.98
5	1	5.5	59.2	90	-6	0.88
6	4	5.5	86	52	-8	0.97
7	4	1	76.9	67	4	0.96
8	2.5	1	71.3	73.4	23	0.94
9	1	1	65.4	95	-16	0.84
10	2.5	10	57.2	77.1	6	0.98
11	2.5	5.5	76.5	69	32	0.97

Table S2– ANOVA table of the CCF design model

Source	Sum of squares	Degrees of freedom	Mean square	F-value	P-value
Protein entrapment					
Model	934.85	5	186.97	11.61	0.0088
A- Alginate (%)	594.01	1	594.01	36.87	0.0017
B- CaCl ₂ (%)	140.17	1	140.17	8.7	0.0319
AB	24.5	1	24.5	1.52	0.2723
A ²	0.16	1	0.16	9.828E-003	0.9249
B ²	166.21	1	166.21	10.32	0.0237
Residual	80.55	5	16.11		
Lack of fit	74.53	3	24.84	8.25	0.11
Pure error	6.02	2	3.01		
Cor total	1015.4	10			
Release					
Model	1559.78	5	311.95	11.45	0.0091
A- Alginate (%)	1139.88	1	1139.88	41.84	0.0013
B- CaCl ₂ (%)	0.000	1	0.00	0.00	1
AB	31.92	1	31.92	1.17	0.3285
A ²	68.29	1	68.29	2.51	0.1742
B ²	225.86	1	225.86	8.29	0.0346
Residual	136.23	5	27.25		
Lack of fit	92.29	3	30.75	1.4	0.4424
Pure error	43.94	2	21.97		
Cor total	1696.01	10			
Swelling					
Model	3378.42	5	675.68	18.97	0.0029
A- Alginate (%)	0	1	0	0	1
B- CaCl ₂ (%)	1160.17	1	160.17	4.5	0.0875
AB	361	1	361	10.13	0.0244
A ²	2185.01	1	2185.01	61.33	0.0005
B ²	156.84	1	156.84	4.4	0.09
Residual	178.12	5	35.62		
Lack of fit	117.46	3	39.15	1.29	0.4645
Pure error	60.67	2	30.33		
Cor total	3556.55	10			
Sphericity					
Model	0.029	5	5.719E003	26.58	0.0013
A- Alginate (%)	0.017	1	0.017	79.25	0.0003
B- CaCl ₂ (%)	1.500E-0.004	1	1.500E-004	0.7	0.442
AB	2.500E-005	1	2.500E-005	0.12	0.7472
A ²	7.865E-00.3	1	7.885E-003	36.61	0.0018
B ²	1.095E-003	1	1.095E-003	5.08	0.0738
Residual	1.077E-003	5	2.154E-004		
Lack of fit	1.010E-003	3	3.367E-004	10.10	0.0914
Pure error	6.667E-005	2	3.333E-005		
Cor total	0.03	10			

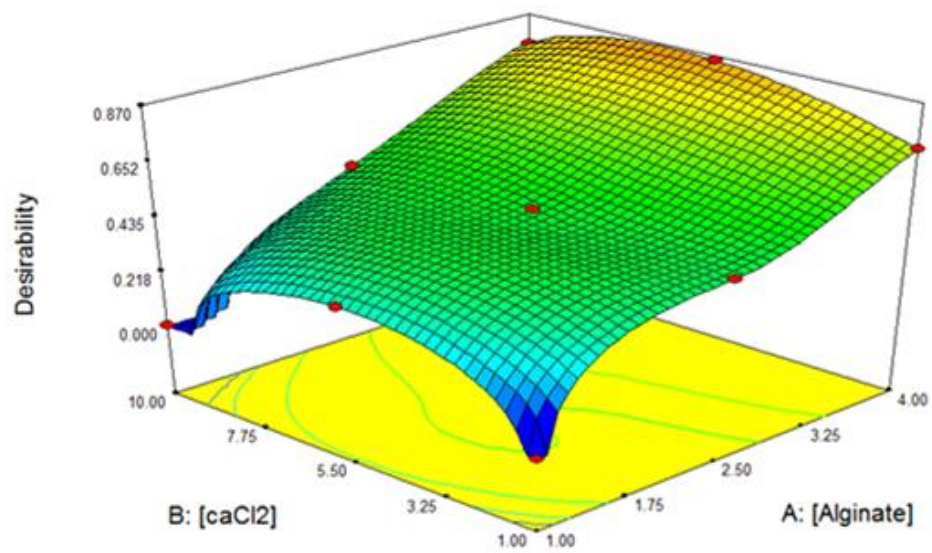


Figure S1– Three-dimensional surface plot of the interaction of the different variables when the optimal conditions are selected.