

**Supplementary Table S1.** Coded levels and real values for EMCP extraction process and yield results. Runs were reported following their standard order.

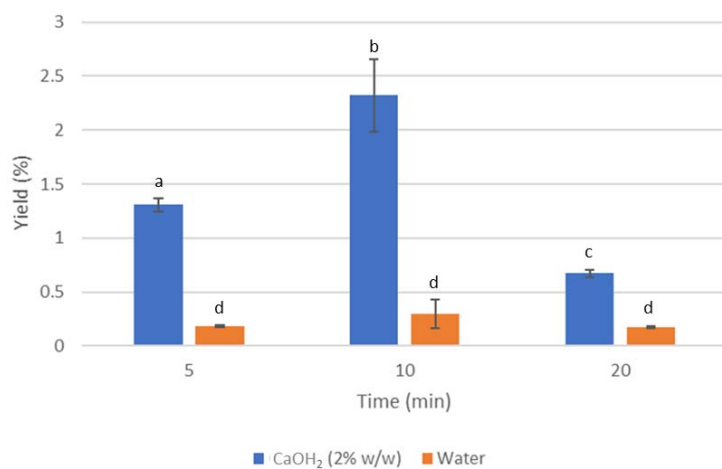
Run	Coded level (real value)		Extraction yield (%)
	X <sub>1</sub> (Ca <sup>2+</sup> loading %)	X <sub>2</sub> (Time)	
1	-1 (1.2)	-1 (5.0)	0.82
2	-1 (1.2)	+1 (12.0)	0.83
3	+1 (4)	-1 (5.0)	3.81
4	+1 (4)	+1 (12.0)	3.28
5	-1.414 (0.6)	0 (9.0)	0.68
6	+1.414 (4.6)	0 (9.0)	4.80
7	0 (2.6)	-1.414 (4.0)	1.78
8	0 (2.6)	+1.414 (14.0)	1.86
9	0 (2.6)	0 9.0	2.32
10	0 (2.6)	0 9.0	2.57
11	0 (2.6)	0 9.0	2.60

**Supplementary Table S2.** Coded levels and real values for CCP extraction process and yield results. Runs were reported following their standard order.

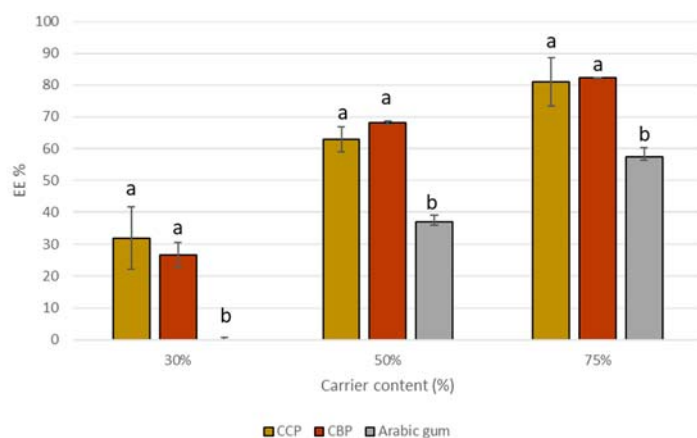
Run	Coded level (real value)		Extraction yield (%)
	X <sub>1</sub> (Temperature °C)	X <sub>2</sub> : (Time)	
1	-1 (90)	-1 (5)	9.16
2	-1 (90)	+1 (15)	7.27
3	+1 (115)	-1 (5)	15.30
4	+1 (115)	+1 (15)	15.85
5	-1.414 (84.822)	0 (10)	5.29
6	+1.414 (120.177)	0 (10)	16.19
7	0 (102.5)	+ 1.414 (2.982)	8.73
8	0 (102.5)	-1.414 (17.071)	12.89
9	0 (102.5)	0 (10)	12.63
10	0 (102.5)	0 (10)	12.84
11	0 (102.5)	0 (10)	12.85

**Supplementary Table S3.** Coded levels and real values for CBP extraction process and yields results. Runs were reported following their standard order.

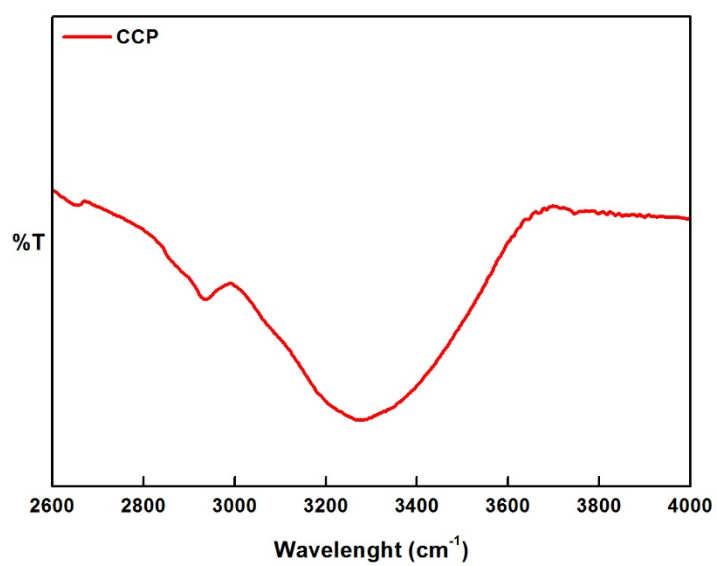
Run	Coded levels (real values)			Extraction yields (%)
	X <sub>1</sub> (Temperature °C)	X <sub>2</sub> (time)	X <sub>3</sub> (solvent/raw material L/g)	
1	-1 (30)	-1 (30)	-1 (5)	13.53
2	-1 (30)	-1 (30)	+1 (10)	14.21
3	-1 (30)	+1 (120)	-1 (5)	13.49
4	-1 (30)	+1 (120)	+ 1 (10)	18.51
5	+1 (60)	-1 (30)	-1 (5)	9.02
6	+1 (60)	-1 (30)	+1 (10)	14.43
7	+1 (60)	+1 (120)	-1 (5)	10.43
8	+1 (60)	+1 (120)	+1 (10)	17.67
9	-1.682 (19.7)	0 (75)	0 (7.5)	12.86
10	+1.682 (70.226)	0 (75)	0 (7.5)	13.46
11	0 (45)	-1.682 (0)	0 (7.5)	0
12	0 (45)	+1.682 (150)	0 (7.5)	12.82
13	0 (45)	0 (75)	-1.682 (3.3)	3.71
14	0 (45)	0 (75)	+1.682 (11.7)	16.15
15	0 (45)	0 (75)	0 (7.5)	10.85
16	0 (45)	0 (75)	0 (7.5)	10.40
17	0 (45)	0 (75)	0 (7.5)	10.68



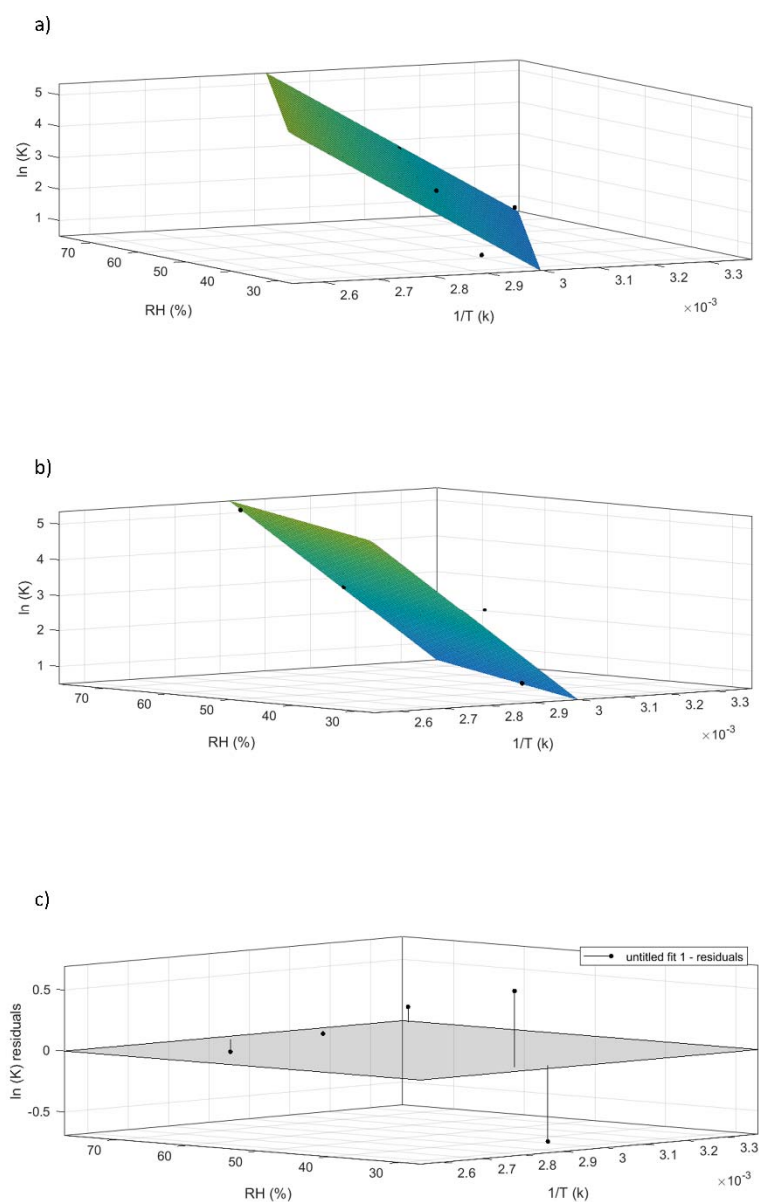
**Figure S1.** EMCP extraction yields. They were obtained using 10:1 solvent (water or 2% Ca(OH)<sub>2</sub> solution) to raw material ratio, at 120 °C, after 5, 10, and 20 min. Different capital letters indicate significant differences ( $p = 0.05$ ).



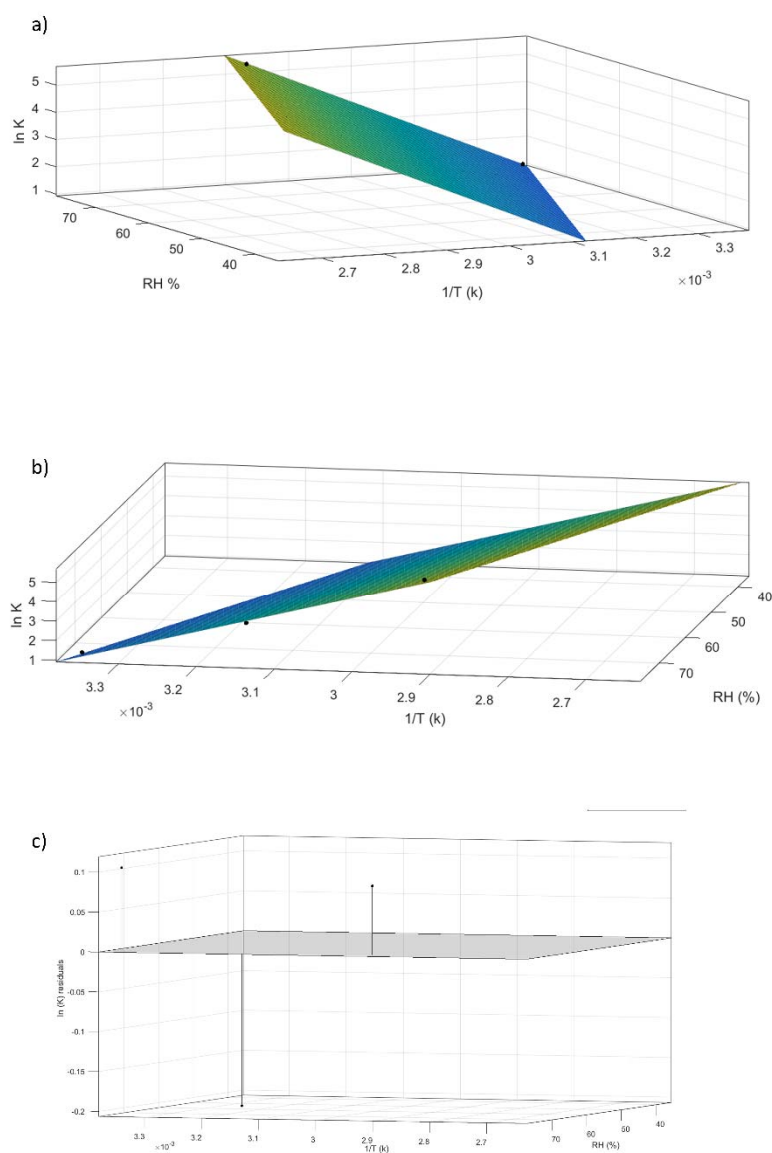
**Figure S2.** Encapsulation efficiency (EE%) registered for MCE-CCP and MCE-CBP ingredients obtained using 30, 50, and 75% (w/w) of polysaccharide carrier. Arabic gum (30, 50, and 75% (w/w)) was used as reference carrier. Different capital letters indicated significant differences between ingredients with the same core/carrier ratio ( $p = 0.05$ ).



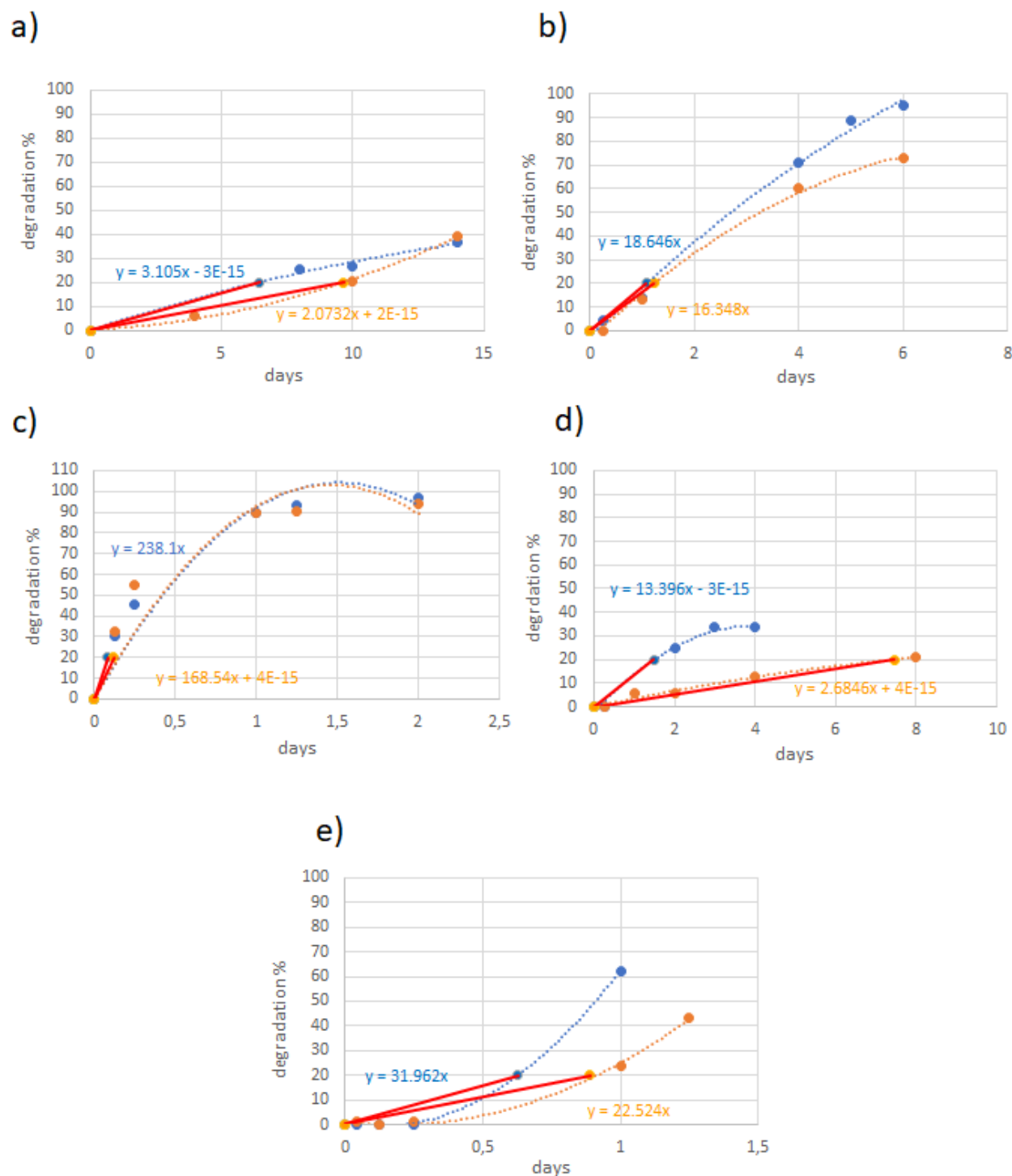
**Figure S3.** –OH stretching of CCP centered at 3,275 cm<sup>-1</sup>.



**Figure S4.** Multilinear regression model for MCE-CCP (50/50) ingredient. a) and b) Different perspectives of a three-dimensional surface plot of the model generated by the Matlab curve-fitting tool for MCE-CCP (50/50) ingredient. c) The residual plot generated using the same tool ( $p = 0.05$ ).



**Figure S5.** Multilinear ASAP model for MCE-CCP (25/75) ingredient. a) and b) Different perspectives of a three-dimensional surface plot of the model generated by the Matlab curve-fitting tool for MCE-CCP (25/75) ingredient. c) The residual plot generated using the same tool ( $p=0.05$ ).



**Figure S6.** Kinetic graphs of C3G degradation in MCE-CCP (50/50) (blue) and MCE-CCP (25/75) (orange) ingredients when exposed to a) 25 °C - 75% RH, b) 45 °C - 75% RH, c) 70 °C - 75% RH, d) 70 °C - 30% RH, and e) 80 °C - 30% RH. Degradation rates were extrapolated from the slope of the straight line (red line) going from the origin to the point corresponding to the specification limit of degradation.