

Supplementary material

Cinnamon Essential Oil Nanocellulose Based-Pickering Emulsions: Processing Parameters Effect on Their Formation, Stabilization, and Antimicrobial Activity

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Statistical results

Table S1. Tukey test for CNC-stabilized emulsions for droplet sizes of fresh emulsions.

	PE-1CNC-12-30-3	PE-0.5CNC-10-30-3	PE-1CNC-10-20-3	PE-0.5CNC-12-20-3	PE-1CNC-10-30-7	PE-0.5CNC-12-30-7	PE-1CNC-12-20-7	PE-0.5CNC-10-20-7
PE-1CNC-12-30-3		0.5726	0.5443	0.3441	0.9589	0	0.4044	1
PE-0.5CNC-10-30-3	2.644		1	0.001273	0.9941	0	1	0.4857
PE-1CNC-10-20-3	2.701	0.05781		0.001076	0.992	0	1	0.458
PE-0.5CNC-12-20-3	3.132	5.776	5.833		0.02224	0	0.0004467	0.4233
PE-1CNC-10-30-7	1.541	1.102	1.16	4.673		0	0.9702	0.9272
PE-0.5CNC-12-30-7	13.92	11.27	11.22	17.05	12.38		0	0
PE-1CNC-12-20-7	2.995	0.3512	0.2934	6.127	1.454	10.92		0.3269
PE-0.5CNC-10-20-7	0.1783	2.822	2.88	2.954	1.719	14.1	3.173	

Table S2. Tukey test for CNF-stabilized emulsions for droplet sizes of fresh emulsions.

	PE-1CNF-12-30-3	PE-0.5CNF-10-30-3	PE-1CNF-10-20-3	PE-0.5CNF-12-20-3	PE-1CNF-10-30-7	PE-0.5CNF-12-30-7	PE-1CNF-12-20-7	PE-0.5CNF-10-20-7
PE-1CNF-12-30-3		0.246	4.26×10^{-10}	4.25×10^{-10}	4.25×10^{-10}	4.25×10^{-10}	4.25×10^{-10}	4.25×10^{-10}
PE-0.5CNF-10-30-3	3.387		4.25×10^{-10}	4.25×10^{-10}	4.25×10^{-10}	4.25×10^{-10}	4.25×10^{-10}	4.25×10^{-10}
PE-1CNF-10-20-3	11.35	14.73		0.994	0.6433	0.3344	1	9.18×10^{-10}
PE-0.5CNF-12-20-3	12.45	15.84	1.105		0.9764	0.8331	0.9983	6.058E-08
PE-1CNF-10-30-7	13.85	17.23	2.498	1.393		0.9998	0.736	1.27×10^{-5}
PE-0.5CNF-12-30-7	14.5	17.89	3.156	2.051	0.658		0.4235	0.00012
PE-1CNF-12-20-7	11.55	14.94	0.2019	0.9027	2.296	2.954		1.65×10^{-9}
PE-0.5CNF-10-20-7	21.06	24.45	9.713	8.608	7.215	6.557	9.511	

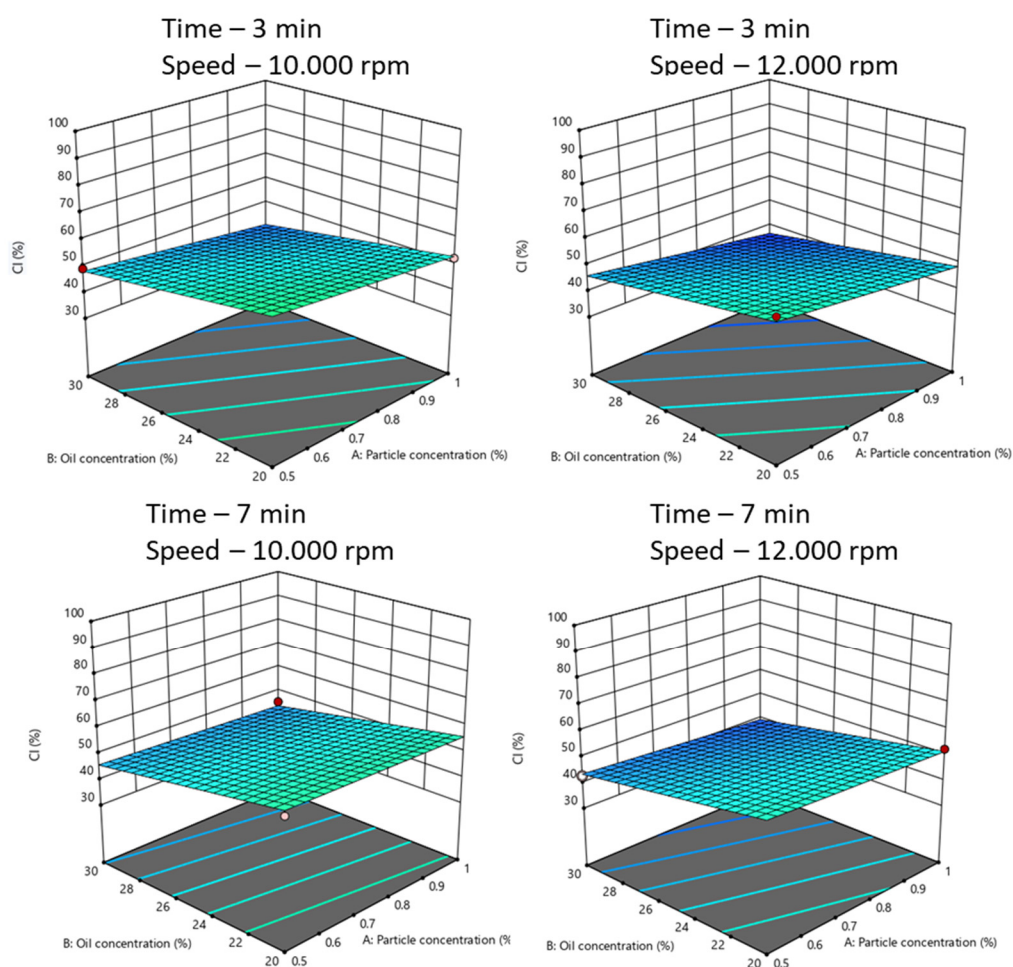


Figure S1. Effects of parameters processing on the emulsions creaming index, analyzed by response surface plots.

Like IC graphs (Figure S1), dark, blue-colored graphs are preferable, indicating smaller sizes of average drop diameters. The graphs indicate a trend to oil concentration and homogenization speed to be constant at higher values. Since all emulsions were prepared at the same volume, possibly the conditions of 30% of essential oil and 12,000 rpm increased the energy density of the system, which consequently resulted in smaller average diameters due to the greater energy available to disperse the drops of essential oil and adsorption the CNCs at the oil/water interface.

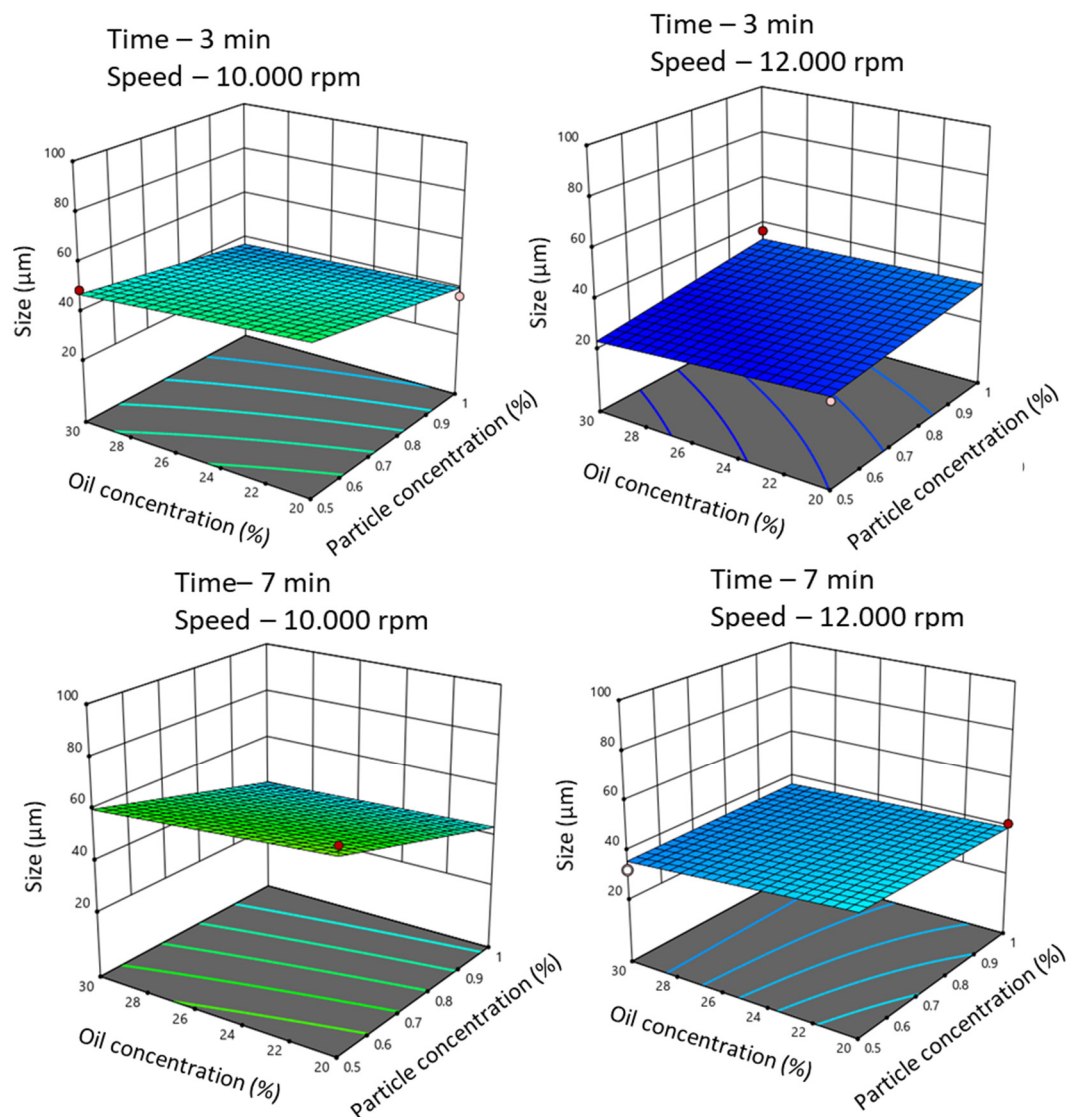


Figure S2. Effects of parameters processing on the emulsion's droplet size, analyzed by response surface plots.

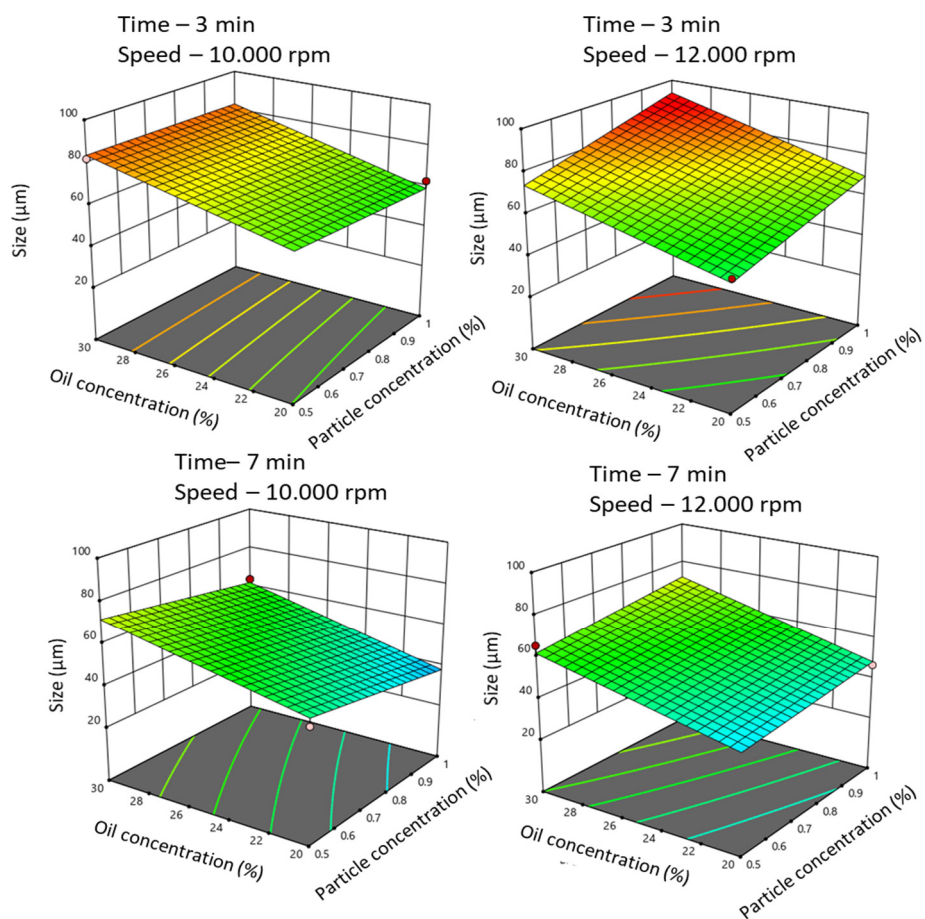


Figure S3. Effects of parameters processing on the emulsion's droplet size, analyzed by response surface plots.