Supporting Information

Table S1. Composition (% w/w) of the base emulsion system employed as the reference formulation.

Ingredients	INCI	Function	(%)
Aqueous phase			
Water	Aqua	Main solvent	85.51
Glycerin	Glycerin	Humectant	5.00
Potassium sorbate	Potassium Sorbate	Preservative	0.20
Vivapur CS TEX Easy	Microcrystalline Cellulose, Cellulose Gum e Xanthan Gum	Thickener,rheology stabilizer	5.50
Oil phase			
Sunflower oil	Helianthus Annuus Seed Oil	Emollient	2.53
Plum oil	Prunus Domestica Seed Oil	Emollient	1.26

Table S2. Formulation ingredients (% w/w) for emulsion development.

Ingredients	F0	F1	F2	F3	F4
Aqueous phase					
Water	85.51	85.51	85.51	85.51	85.51
Glycerin	5.00	5.00	5.00	5.00	5.00
Potassium sorbate	0.20	0.20	0.20	0.20	0.20
Vivapur CS TEX Easy	5.50	2.75	2.75	2.75	1.50
Native tapioca starch	-	2.75	-	-	-
Tapioca with oleic acid	-	-	2.75	-	-
Tapioca with PMW	-	-	-	2.75	4.00
Oil phase					
Sunflower oil	2.53	2.53	2.53	2.53	2.53
Plum oil	1.25	1.26	1.26	1.26	1.26

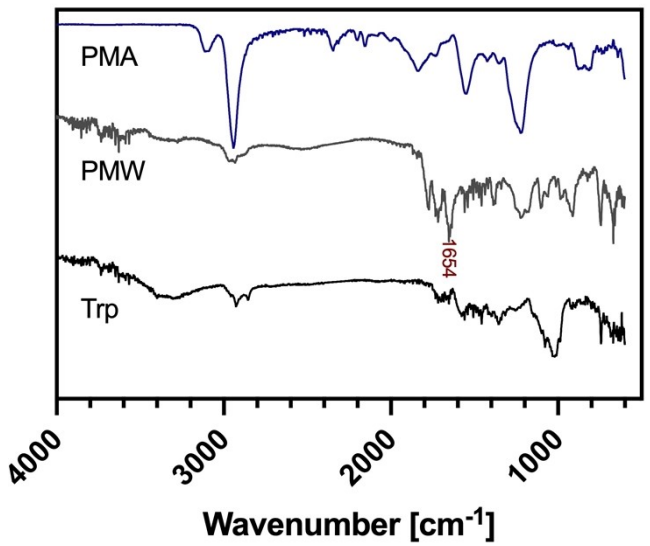
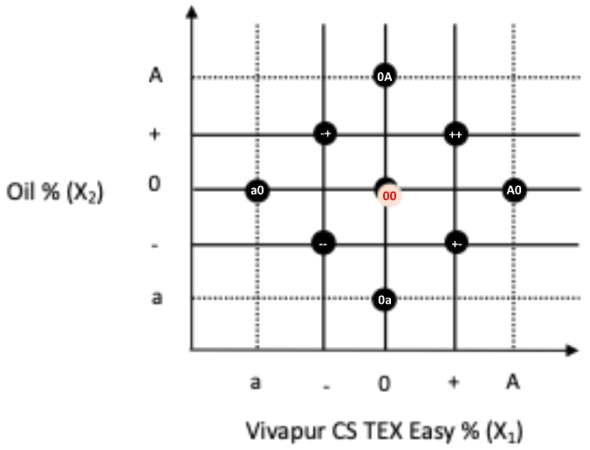


Figure S1. Comparison of *FT-IR spectra of poly(isobutylene-alt-maleic anhydride) (PMA), Tryptophan(Trp) and tryptophan-grafted-poly(isobutylene-alt-maleic anhydride) (PMW).*



Variable	Range (%)
Vivapur CS TEX Esy	3-8
Oil	10-40

Configuration	Oil (%)	Vivapur CS TEX Easy (%)	Glycerin (%)	Water with preservative (%)
++	40.00	8.00	5.00	47.00
-+	10.00	8.00	5.00	77.00
0A	25.00	9.04	5.00	60.96
00	25.00	5.50	5.00	64.50
--	10.00	3.00	5.00	82.00
a0	3.79	5.50	5.00	85.71
A0	46.21	5.50	5.00	43.26
0a	25.00	1.96	5.00	68.04
+-	40.00	3.00	5.00	52.00
00	25.00	5.50	5.00	64.50

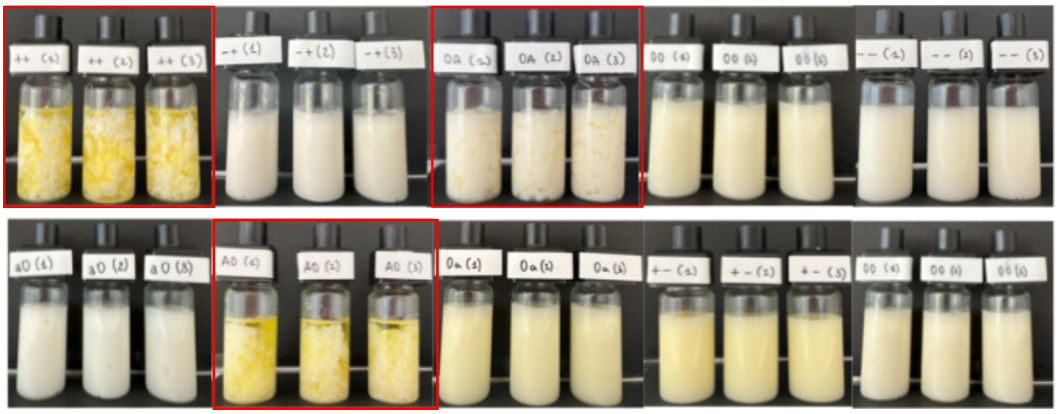
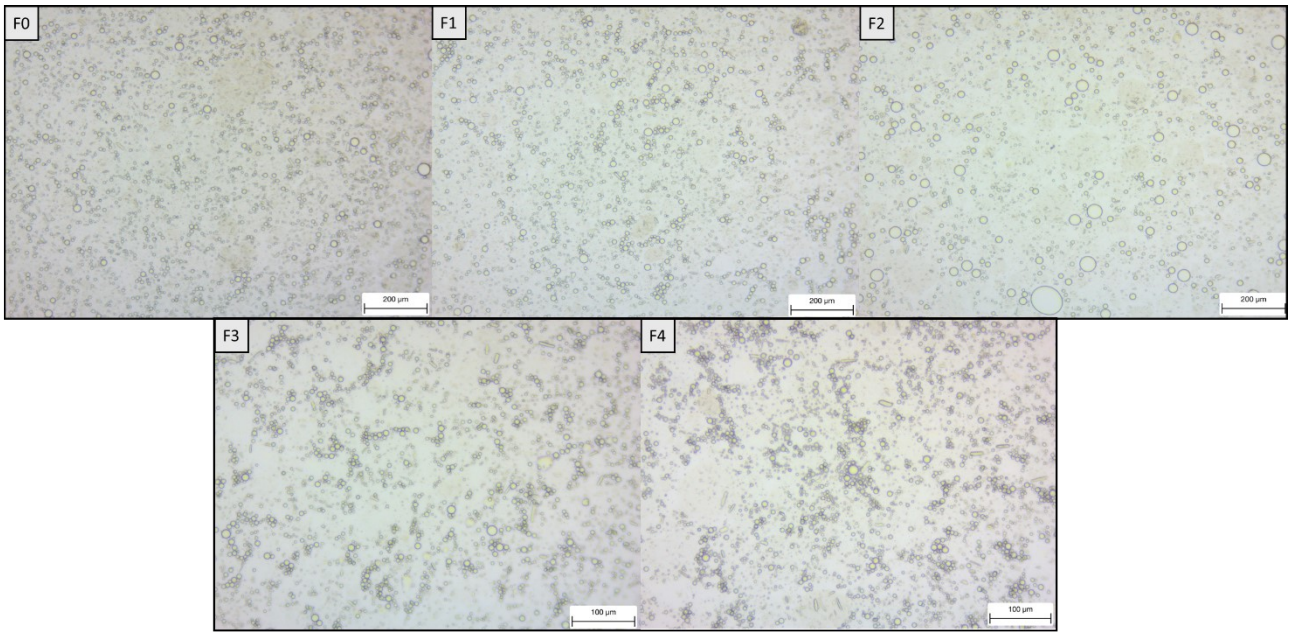


Figure S2. Representative images of samples generated through the Design of Experiments (DoE). Red boxes denote conditions leading to the formation of visible yellow aggregates or precipitates.



	Median D (µm)	Modal D (µm)	Mean V (µm)	Std Dev (µm)
F0	14.02	12.34	14.34	3.30
F1	16.27	11.77	17.35	5.83
F2	17.56	26.90	20.00	8.37
F3	6.70	7.11	6.69	1.38
F4	7.17	6.77	7.27	2.53

Figure S3. Representative optical micrographs of the emulsions with associated particle size statistics (median, mode, mean, and standard deviation) obtained through granulometric analysis.

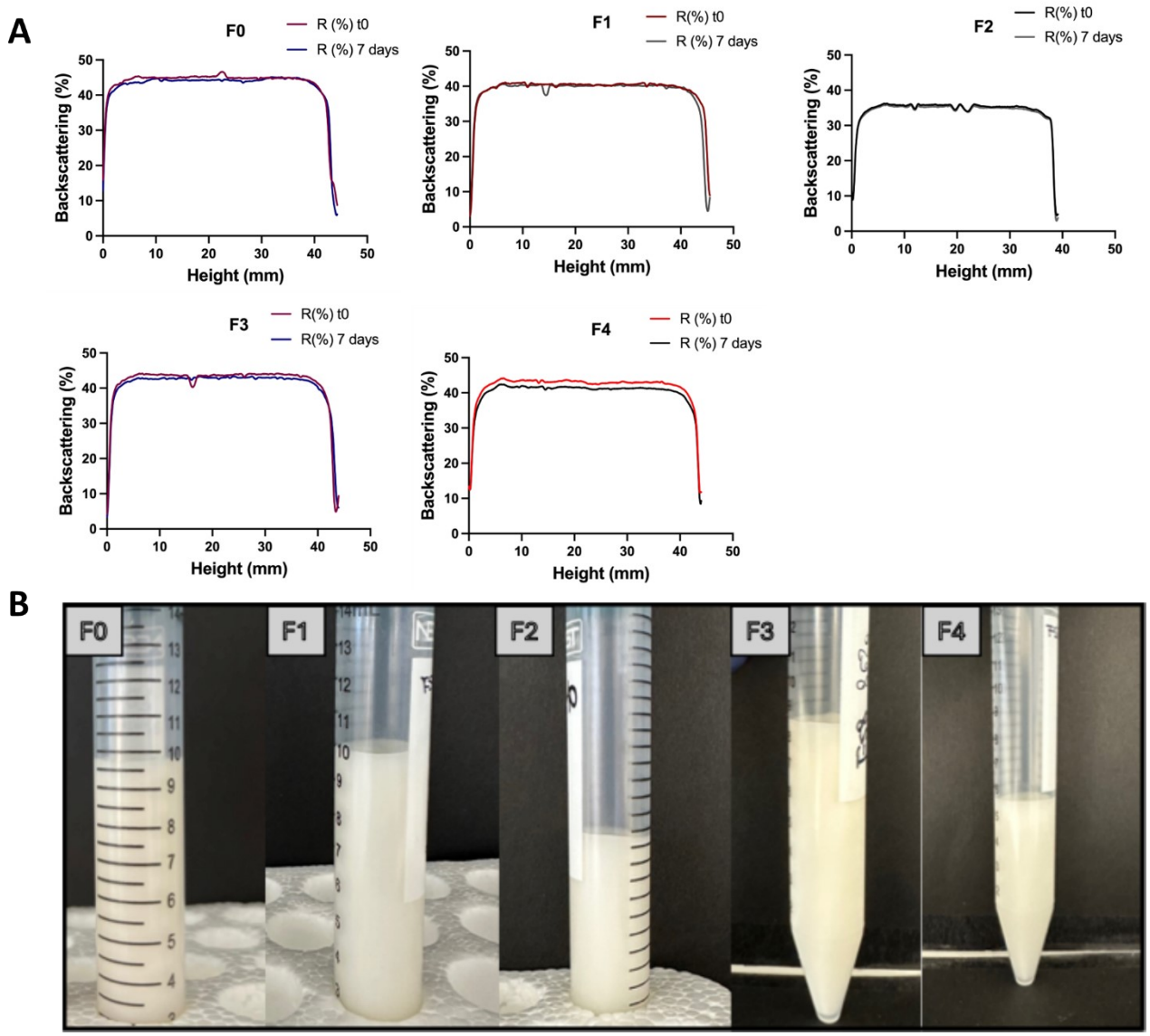


Figure S4. Emulsion stability of formulations F0–F4 evaluated by (a) Turbiscan analysis at initial (t_0) and 7-day time points, and (b) visual inspection after accelerated centrifugation.