

Supplementary material

Supplementary Table 1. Effect of homogenization speed, sonication amplitude and sonication time on mean droplet diameter (nm), polydispersity index (PDI), and zeta potential (mV) of nanoemulsions prepared using lecithin: polysorbate 80 at 1:1 ratio without using any coating material

| Homogenization speed (rpm) | Sonication Amplitude (%) | Sonication time (min) | Mean droplet diameter (nm) | Polydispersity index (PDI) | Zeta potential (mV) |
|----------------------------|--------------------------|-----------------------|----------------------------|----------------------------|--------------------------|
| 3000 | 50% | 15 | 233.63±6.46 ^a | 0.44±0.05 ^a | -3.78±1.42 ^b |
| 3000 | 50% | 30 | 130.67±2.27 ^c | 0.25±0.03 ^{cd} | -12.57±1.17 ^c |
| 3000 | 80% | 15 | 127.60±8.58 ^e | 0.26±0.01 ^{cd} | -13.93±0.32 ^c |
| 3000 | 80% | 30 | 156.60±7.37 ^d | 0.35±0.07 ^b | -1.58±1.66 ^b |
| 6000 | 50% | 15 | 219.67±11.85 ^b | 0.31±0.05 ^{bc} | -1.97±0.99 ^b |
| 6000 | 50% | 30 | 127.77±2.45 ^e | 0.22±0.02 ^d | -12.63±0.35 ^c |
| 6000 | 80% | 15 | 149.10±1.71 ^d | 0.28±0.01 ^{bcd} | -3.29±0.91 ^b |
| 6000 | 80% | 30 | 171.00±2.09 ^c | 0.32±0.04 ^{bc} | 1.05±2.60 ^a |

Different superscript letters (a-e) indicate significantly different means between each column's values at $p < 0.05$.

Supplementary Table 2. Effect of surfactants lecithin and polysorbate 80 at different proportions on mean droplet diameter (nm), polydispersity index (PDI), and zeta potential (mV) of nanoemulsions prepared using homogenization at 3,000 rpm for 5 min followed by sonication at 80% amplitude for 15 min without using coating material.

| Lecithin: polysorbate 80 | Mean droplet diameter (nm) | Polydispersity index (PDI) | Zeta potential (mV) |
|--------------------------|----------------------------|----------------------------|--------------------------|
| 1:0 | 147.73±1.07 ^c | 0.47±0.01 ^a | -0.95±0.74 ^{ab} |
| 0:1 | 165.10±0.20 ^b | 0.30±0.03 ^c | -4.61±1.72 ^c |
| 2:1 | 134.87±2.01 ^d | 0.32±0.02 ^c | -3.04±1.91 ^{bc} |
| 1:1 | 127.60±8.58 ^d | 0.26±0.01 ^d | -13.93±0.32 ^d |
| 1:2 | 195.33±1.57 ^a | 0.37±0.01 ^b | 1.23±1.40 ^a |

Different superscript letters (a-d) indicate significantly different means between each column's values at $p < 0.05$.

a)



CE-WT



CE-HG

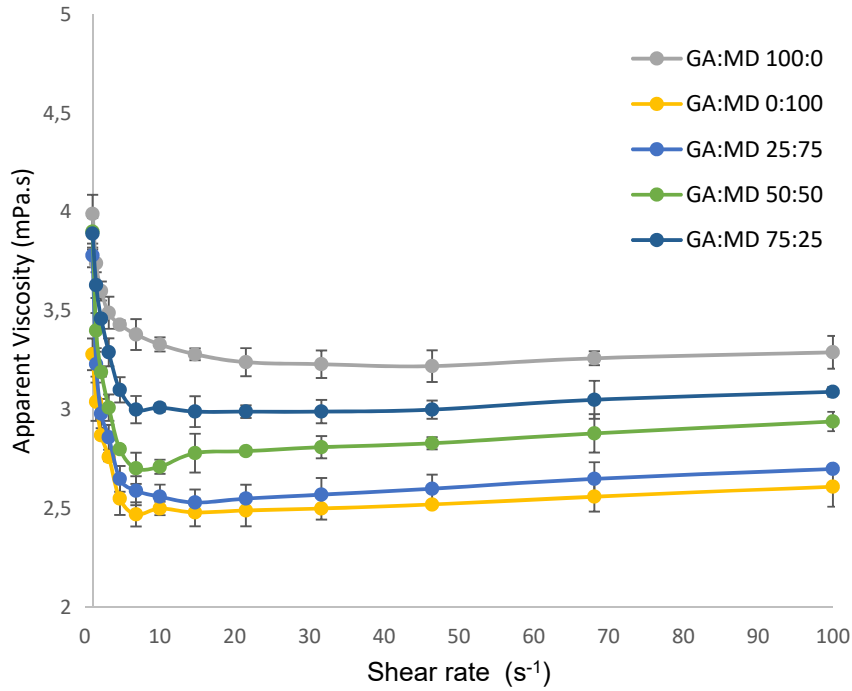


NE-US

b)



Supplementary Fig. 1. Visual appearance of a) coarse emulsion after water titration (CE-WT), coarse emulsion after homogenization (CE-HG) and nanoemulsion after ultrasound (NE-US) immediately after preparation and b) nanoemulsions prepared using different proportions of coating materials of gum arabic (GA) and maltodextrin (MD) after three weeks of preparation.



Supplementary Fig. 2. Plots of apparent viscosity (mPa.s) versus shear rate (s⁻¹) of nanoemulsions developed using GA (gum arabic): MD (Maltodextrin) at different proportions of 0:100, 25:75, 50:50, 75:25, and 0:100.