Biopolymers-based Nano Carriers in Food System

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In this study, a nanoemulsion based on biopolymers were prepared with aim to provide a secure, potential and smaller size nanocarrier for food, cosmetic and medical applications. chitosan was modified into an amphiphilie through esterification between its carboxyl and the hydroxyl on glycerol-α-monostearate (GMS). The synthesis was carried out in mild way with aid of 1-ethyl-3-(3-dimethylaminopropyl)-carbodiimide hydrochloride (EDC) and the conjugation was verified via FTIR and 1H NMR. A fine oil/water/surfactant (O/W/S) nanoemulsion, consisting of methylene chloride as oil phase (O), chitosan water solution (W), nonionic Tween and Span offered as surfactants (S), was then prepared by ultrasonication. The optimal ratio of disperse phase was screened in nanoemulsion formed and Tween 80 and Span 20 at required HLB 12.5 with ratio of O/S (ROS) was 60, account for 5% (w/w) in emulsion system was found to be the optimal disperse phase ration, giving rise to the smallest droplet size 39.74 nm and lower PdI 0.341. Chitosan nanoemulsion formed and underwent solvent evaporation to remove methylene chloride. Smallest droplet size of chitosan nanoemulsion was 41.95 nm and contracted to 38.86 nm 96 hrs later in storage. Studies revealed that Higher DS or lower Mw was favorable to form smaller emulsified droplets. In addition, morphological characterization was studied via electronic microscopy.

Key words: chitosan, nanoemulsion, solvent evaporation, methylene chloride