

Effects of Type and Concentration Stabilizers on the Characteristics of Nutmeg Oil Nanoemulsions Prepared by High-Pressure Homogenization

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Abstract : Nutmeg oil is one of the essential oils that have the ability as an antibacterial so it potentially uses to inhibit the growth of undesirable microbes in food. However, the essential oil that has low solubility in water, high volatile content, and strong aroma properties is difficult to apply in to foodstuffs. Therefore, the oil-in-water nanoemulsion system was used in this research. Gelatin, lecithin and tween 80 with 10%, 20%, 30% concentrations have been examined for the preparation of nutmeg oil nanoemulsions. The physicochemical properties and stability of nutmeg oil nanoemulsion were analyzed on viscosity, creaming index, emulsifying activity, droplet size, and polydispersity index. The results showed that the type and concentration stabilizer had a significant effect on viscosity, creaming index, droplet size and polydispersity index ($P \leq 0,01$). The nanoemulsions stabilized with tween 80 had the best stability because the creaming index value was 0%, the emulsifying activity value was 100%, the droplet size was small (79 nm) and the polydispersity index was low (0.10) compared to the nanoemulsions stabilized with gelatin and lecithin. In brief, Tween 80 is strongly recommended to be used for stabilizing nutmeg oil nanoemulsions.

Keywords : nanoemulsion, nutmeg oil, stabilizer, stability

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