

INTISARI

PEMBUATAN MINYAK MASAK PADAT DARI MINYAK KELAPA DENGAN METODE EMULSI MELALUI INTERESTERIFIKASI

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Penelitian pembuatan minyak masak padat dari minyak kelapa dengan metode emulsi melalui interesterifikasi telah dilakukan. Penelitian bertujuan memperoleh etil ester dan fraksinasi etil laurat yang optimum; lemak padat dengan titik leleh seperti minyak masak padat; minyak masak padat dengan karakter seperti *margarine* dan *shortening*. Penelitian ini diawali dengan reaksi transesterifikasi antara minyak kelapa dan etanol dengan variasi waktu dan kecepatan pengadukan. Etil ester dianalisis dengan GC (Gas Chromatography) dan GC-MS (Gas Chromatography-Mass Spectroscopy), lalu difraksinasi menjadi etil laurat. Selanjutnya, etil laurat diinteresterifikasi dengan variasi konsentrasi (v/v) antara minyak kelapa dengan etil laurat dan titik leleh minyak masak padat diukur dengan menggunakan *Slip Melting Point*. Tahap berikutnya, emulsifikasi minyak masak padat dengan variasi suhu dan rasio emulsifier. Karakterisasi emulsi minyak masak padat dilakukan dengan pengukuran viskositas, globula/*droplet size*, dan uji kekerasan.

Hasil transesterifikasi optimum sebesar 76,48 % diperoleh pada rasio minyak kelapa/etanol/NaOH 1:2:0,02 (100 mL : 50 mL : 2 g) dengan kecepatan pengadukan 300 rpm. Kecepatan pengadukan dan waktu reaksi berturut-turut di atas 400 rpm dan 30 menit menghasilkan rendamen etil ester di atas 80 %. Titik leleh minyak masak padat dengan kisaran 33-51 °C diperoleh pada kondisi etil ester difraksinasi dengan konsentrasi etil laurat diatas 60 %, lalu diinteresterifikasi dengan minyak kelapa murni(variasi v/v). Interaksi yang terjadi pada proses interesterifikasi melibatkan gugus O-H, C-O, dan C-H berdasarkan analisis spektra FT-IR (Fourier Transform Infra Red). Emulsifikasi minyak masak padat dengan variasi suhu 45 °C dan rasio emulsifier 0,5 g CMC (Carboxy Methyl Cellulose) menunjukkan emulsi yang stabil. Karakterisasi produk emulsi minyak masak padat terhadap kadar air berada pada kisaran 0,04 - 0,09 %; asam lemak bebas 0,28 - 0,49 %; bilangan peroksida 0,61-0,74 mg O₂/100 g; dan uji kekerasan produk emulsi minyak padat berada pada kisaran 8,4942 - 15,7444 gf/cm². Dengan demikian produk minyak masak padat yang dihasilkan memenuhi kriteria *margarine* dan *shortening* berdasarkan SNI 01-3541-2002.

Kata Kunci : minyak kelapa, minyak masak padat, transesterifikasi, interesterifikasi, dan emulsifikasi

ABSTRACT

PREPARATION OF SOLID COOKING OIL FROM COCONUT OIL WITH EMULSION METHOD THROUGH INTERESTERIFICATION

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Research on preparation of solid cooking oil from coconut oil with emulsion method through interesterification has been performed. The research aimed was to obtain optimum ethyl ester and fractionation of ethyl laurate; solid fat which has a melting point similar to the solid cooking oil; solid cooking oil with characters such as margarine and shortening. This research was initiated by the transesterification reaction between coconut oil and ethanol with variations in reaction time and stirring speed. Ethyl ester was analyzed by GC (Gas Chromatography) and GC-MS (Gas Chromatography-Mass Spectroscopy), and then fractionated into ethyl laurate. Subsequently, ethyl lauric subjected to interesterification with various concentrations (v/v) of coconut oil with lauric ethyl; and the melting point of solid cooking oil was measured using Slip Melting Point. The next stage, solid cooking oil was emulsified with variations in temperature and the ratio of emulsifier. Characterization of solid oil emulsion was carried out by measuring the viscosity, globule/droplet size, and hardness.

The optimum transesterification result of 76.48 % was obtained at the ratio of oil/ethanol/NaOH 1: 2: 0.02 (100 mL : 50 mL : 2 g) with stirring speed of 300 rpm. The stirring speed and reaction time in a row above the 400 rpm and 30 minutes produce yield ethyl ester above 80 %. The melting point of solid cooking oil in the range of 33-51 °C was obtained on condition ethyl ester which was fractionated with ethyl lauric at concentration above 60 %, and then it was interesterified with coconut oil (variations v/v). The process of interesterification involved groups O-H, C-O and C-H based on the analysis of FT-IR (Fourier Transform Infra Red) spectra. Solid cooking oil was emulsified with temperature variations of 45 °C and 0.5 g CMC emulsifier ratio indicates a stable emulsion. Characterization of emulsion products of solid cooking oil toward the water content in the range of 0.04 to 0.09 %; free fatty acids from 0.28 to 0.49 %; peroxide value from 0.61 to 0.74 mg O₂/100 g; and hardness test solid-oil emulsion product is in the range from 8.4942 to 15.7444 gf/cm². Thus the produced solid cooking oil products met the criteria of margarine and shortening based on SNI 01-3541-2002.

Keywords: coconut oil, solids cooking oil, transesterification, interesterification, and emulsification