

UNIVERSITI TEKNOLOGI MARA

**CHARACTERIZATION OF GAMMA LINOLENIC ACID (GLA)
NANOEMULSION**

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ABSTRACT

The purpose of this study was to develop a stable microemulsion containing gamma linolenic acid with an acceptable particle size range as well as a good particle size distribution. Gamma-linolenic acid (GLA) is an important conditionally EFA. GLA is an omega-6 polyunsaturated fatty acid (PUFA). The fatty acid molecule is comprised of 18 carbon atoms with three double bonds. It is also known as 18:3n-6; 6,9,12-octadecatrienoic acid; cis-6, cis-9, cis-12- octadecatrienoic acid; and gamolenic acid. GLA is found naturally in the fatty acid fractions of some plant seed oils.

The presences of EFA is known to be effective to promote vascular health, supporting oxygen and nutrient delivery to the skin. Studies have shown that omega-3 fatty acids protect keratinocytes and fibroblasts from free radicals and immune mediators generated by sun exposure, helping to soothe the skin.

Healthy immune mediator activity and arachidonic acid metabolism are supported by the GLA to promotes skin comfort. In addition to that, EFA are also responsible in promoting the elasticity and hydration of the skin for smoother looking skin. Microemulsion is defined as a mixture of component that contains at least three basic component. The three basic components are the oily phase, aqueous phase and the surface active agent. In some cases, there will be the forth component in the system which is called co-surfactant. Co-surfactant is employed to improve the stability of the microemulsion system.

CHAPTER 1

1.0 INTRODUCTION

1.1 Nanoemulsion

Nanoemulsion is the one with droplet sizes below in a range of size of 50-500 nm that appear translucent. This property is due to the fact that light waves are scattered by the droplets only if their sizes exceed about one-quarter of the wavelength of the incident light. Since the visible spectrum of light is composed of wavelengths between 390 and 750 nm, if the droplet sizes in the emulsion are below about 100 nm, the light can penetrate through the emulsion without being scattered. Due to their similarity in appearance, translucent nanoemulsions and microemulsions are frequently confused. There are three basic components in the formulation which are the oily phase, aqueous phase and the surfactant as the surface active agent (Trotta et al.,1996). In addition, there will be the forth component in the system which is called as co-surfactant that usually helps in enhancing the stability of the emulsion. Usually, the particles and the droplets of the dispersed phase is in a range of 10 to 500 nm with a low oil/water interfacial tension (Zhang et al.2008). This preparation is usually transparent due to the droplet size that is