UNIVERSITI TEKNOLOGI MARA (UiTM)

STUDY ON CHARACTERISTICS OF SUNSCREEN CREAMS AND BODY LOTIONS CONTAINING VARIOUS COMBINATIONS OF TITANIUM DIOXIDE AND ZINC OXIDE

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ABSTRACT

Sunscreen cream and lotion is one of agents that can protect skin from sun exposure. In this formulation of sunscreen cream and lotion, the Titanium dioxide (TiO_2) and Zinc oxide (ZnO) are use as inorganic chemical agents that function as UV blocker. Objective of this research is to determine the characterization of sunscreen cream and lotion that containing various ratios of Titanium dioxide (TiO_2) and Zinc oxide (ZnO). Characteristic that can be analyse are sun protection factor value, particle size, spreadability, viscoelasticity, zeta potential, firmness, cohesiveness and consistency of cream. The cream that show having good properties compare to others cream is cream of formulation 7 that contain Titanium dioxide (TiO_2) 4.00gm, Zinc Oxide (Zn0) 2.00gm and olive oil 10gm. The lotion that show have the best properties compare to others lotion is lotion of formulation 14 that contain Titanium dioxide (TiO_2) 6.00gm, Zinc Oxide (Zn0) 2.00gm and olive oil 20gm.

CHAPTER ONE

Introduction

1.1 Background of study

Pharmaceutical creams are semisolid emulsions which are widely used as it altering the physical properties of the skin and as vehicles for the delivery of drugs. An emulsion is defined as two immiscible liquids, one of which is finely subdivided and uniformly distributed as droplets throughout the others. This system is stabilized by the presence of an emulsifying agent. For cream and lotion preparations, they are available as water in oil (W/O) and oil in water (O/W) emulsion. For oil in water emulsions (O/W), it is used for topical applications of water soluble drugs, mainly for local effect. They do not have the greasy texture associated with oily bases and therefore pleasant to use and easily washed from skin surfaces. For water in oil emulsions (W/O), it will have an occlusive effect by inhibiting the evaporation of eccrine secretions. This will hydrate the upper layers of the stratum corneum and so is particularly useful for dry skin conditions. This type of emulsions is also useful for cleansing the skin of oil soluble dirt, although its greasy texture is not acceptable for cosmetically (Aulton, 2007).

Titanium dioxide (TiO_2) and zinc oxide (ZnO) minerals are employed in sunscreens as inorganic physical sun blockers. TiO_2 is more effective in ultraviolet B (UVB) and ZnO in the ultraviolet A (UVA) range, the combination of these particles assures a broad-band UV protection. Sunscreens are used to provide protection against adverse effects of ultraviolet (UVB) (290–320 nm) and UVA (320–400 nm)