Novel Light Manipulation Particles Offering Anti-Ageing Benefits

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Abstract

It is now becoming more generally recognised that skin pigmentation is controlled by two critical factors, the translucency of the *stratum corneum* and the colour of the underlying pigment-containing skin components. Skin's natural pigments are principally composed of three molecules: melanin, haemoglobin and collagen. As a person ages, the appearance of ageing is influenced by inconsistencies in the patterns of these three pigments as they reflect back out through the transparent stratum corneum to the eye of the observer. Historically, cosmetic formulations have tried to influence these colours through a covering effect, typically done with opaque, coloured particles that lay down on the surface of the skin and attempt to mask the skin's natural pigments. However, the typical downside of such colouring attempts is that the skin loses a sense of depth and translucency that are indicative of naturally healthy skin. To the observer, a person wearing decorative foundation has skin that appears somewhat flat and two-dimensional. Our company has developed a new skin tone control technology that works to enhance the skin's natural pigmentation and control signs of ageing.

Introduction

Anti-ageing continues to be a major trend in the personal care industry. Some of the reasons this trend continues to exist are due to the maturing baby-boomer generation and general negative feelings surrounding ageing. The conventional ways of combating anti-ageing have involved the use of long-term actives that can take 4-12 weeks to provide visible results. The emergence of a new generation of consumers seeking immediate effects has led to the latest marketing developments in anti-ageing and skin tone control. Over the past few years the market has been inundated with a variety of products delivering instant effects such as colour-adjusting foundations that match an array of skin tones, self-tanning and whitening products that help to alter skin complexion through opaque coverage, and soft focus effects that minimize skin imperfections. The shortfall of these techniques is that the true skin tone and colour is masked.

With today's trends focusing on innate beauty, we felt there had to be a better way to control skin tone without covering up the natural radiance of the skin. When light hits skin it typically transmits 5 mm below the surface into the lower epidermal and dermal layers. As the reflected light travels back toward an observer's eye, it is modified by the three natural pigments found in the skin: collagen, melanin, and hemoglobin. Each pigment reflects light at different wavelengths. Melanin reflects light in brown and yellow wavelengths. Haemoglobin reflects light in red and blue wavelengths and collagen reflects light in green and yellow wavelengths.

The combination of these three components is responsible for the various skin pigmentations seen throughout the world. Skin radiance is an observation of what is occurring below the skin's surface and internal health. As a person ages, the appearance of ageing is influenced by inconsistencies in the patterns of these three pigments as they reflect back out through the transparent *stratum corneum* to the eye of the observer. Collagen breakdown causes yellowing or 'sallowing' of the skin. Oxidation of haemoglobin makes bilirubin, a dark pigmented byproduct. And accumulation of melanin in uneven areas causes age spots and hyperpigmentation.

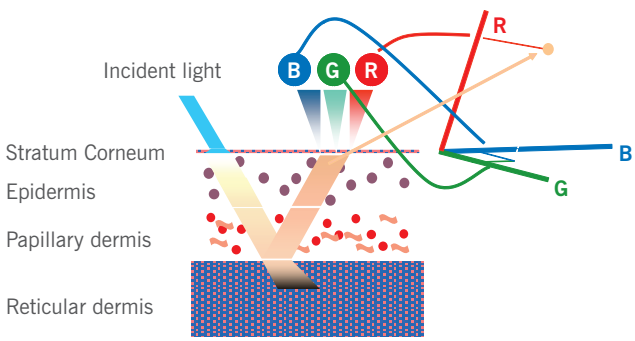

Figure 1. Optical model of skin

The translucency of the skin allows ninety percent of white light to be transmitted through the skin's surface where the lower epidermal and dermal layers reflect light back toward the viewer's eye. As the reflected light travels back toward the source, it is modified by skin's natural pigments: melanin, haemoglobin, and collagen. The viewer's eye captures the modified image.