Photographic Study of LipoLight® OAP/PVA for the Reduction of the Appearance of Skin Imperfections

Authors: Jed A. Riemer, Ph.D. and Nava Dayan, Ph.D. Lipo Chemicals, Inc., New Jersey, USA

Introduction

Aged skin is characterized by a loss of youthful appearance, decreased skin tautness and development of wrinkles. Intrinsic aging differs from photo-aging both clinically and biochemically. In most people these two processes occur simultaneously. The degree of induced damage to aged skin is proportional, especially in Caucasian skin, to the inherent pigmentation and development of rough skin texture. Wrinkles develop over time both when the skin is exposed (coarse wrinkling) and unexposed to sun damage (fine wrinkling) (1). Therefore, when aging, the skin's optical properties change dramatically. Skin pigmentation is the first line of defense against long-term actinic damage. Creation of wrinkles contributes to inconsistency in skin tone, creating areas that are darker than the baseline.

Cosmetics have reduced the visible signs of aging, fine lines and wrinkles, with two major approaches. The first is by the use of numerous bioactive anti-aging ingredients. The second is a physical approach using inorganic materials to mask the appearance of fine lines and other skin imperfections. The approach used in the physical method is known as "soft focus" technology, which is based on the principle of scattered light.

Structure and Function of LipoLight® OAP/PVA

Lipo Chemicals has developed LipoLight OAP/PVA (Optically Activated Particles/PVA encapsulated) - INCI name: Polydodecanamideaminium Triazadiphenylethenesulfonate (and) Polyvinylalcohol Crosspolymer, as a new approach for the reduction of the appearance of wrinkles, pores, and other skin imperfections. LipoLight is designed to combine fluorescent light emission with light diffusion and scattering in order to yield a significantly improved effect compared to simple soft focus powders. The emitted light illuminates the shadows in skin imperfections, thereby giving the illusion that they do not exist.

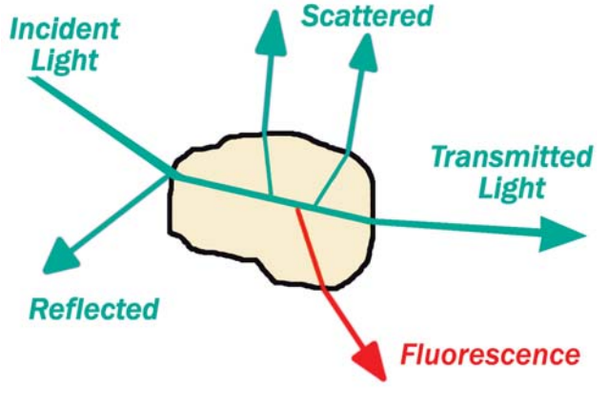

Figure 1. Possible interactions of light with particles.

Interaction of Light with Particles

Natural light is affected in several ways when it interacts with a material (See Fig 1).

It can be scattered, generating, for example, the white appearance of clouds, it can be refracted or bent as experienced with common eyeglasses, or it can be absorbed producing, for example, the myriad of colors found in nature. A less well-known effect, however, is when light of one wavelength is absorbed and then the energy is re-emitted at a second, longer wavelength. This phenomenon, known as fluorescence, is observed in many tropical and marine fish or in the everyday fluorescent light tube.

LipoLight is a fabricated cosmetic material founded on these natural physical phenomena but allowing them to reinforce each other by combining scattering, bending, absorption and fluorescence in one particle. In this way this unique product can act as a small light source on the skin providing a natural way to eliminate the appearance of wrinkles and to increase skin brightness, thus creating an instantaneous youthful appearance.

LipoLight has fluorescent molecules fixed to a nylon particle and then encased in an optically translucent coating. The scattering that occurs from the nylon produces diffuse light that is absorbed by the molecules on the nylon surface. The fluorescence from these molecules is then re-mitted adding to the scattered light and so giving an increased brightness. The translucent encapsulation provides a pathway for bending the different kinds of light, resulting in the emission of diffuse, visible light and contributing to the effect.