TURBISCAN

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Cosmetics

STABILITY AND END-USE PROPERTIES OF PERSONAL CARE PRODUCTS

Abstract

Many cosmetic products are complex colloidal systems, which can either be emulsions, suspensions or foams or even a mixture of these. They are composed of many different ingredients and are generally thermodynamically unstable. Their shelf life is a critical parameter to be determined by the formulator. Moreover, different end-use properties, such as foamability of shampoo or shower gel for example, have to be investigated and optimized.
The Turbiscan® technology is a unique and complete tool, which enables the study of the stability of colloidal dispersions without any dilution or modification of the product. Destabilization processes can be identified and quantified easily up to 50 times earlier than the naked eye. Determining shelf life can be automated *via* the use of the ageing station, Turbiscan ags. Different end-use properties such as foamability may also be measured.

Keywords: emulsion, foam, suspension, shelf life, stability, foamability, Turbiscan®.

Introduction

Most personal care products available in the market are colloidal dispersions composed of many different ingredients (it is common to have formulations with up to 50 different compounds). These final products can be in many different forms such as emulsions, suspensions, foams or mixture of several of them. Their stability is limited in time (shelf life) and has to be investigated thoroughly in order to provide good quality products. The competitive nature of the market, and the high expectations of the consumers, puts pressure on the formulator to develop high quality products in the shortest possible time.

The Turbiscan® range provides the formulator with a complete set of tools to investigate the stability, and end-use properties of the products developed. The different instability phenomena (creaming, sedimentation, flocculation, coalescence) can be identified and quantified *via* different parameters. Allowing an objective analysis to be made. Shelf life can be determined up to 50 times earlier than visual observation, allowing the development time for new products to be significantly reduced. The stability measurements can also be completely automated using the robotized ageing station, Turbiscan ags. Finally, end-use properties such as foamability of shampoo or shower gel, can be monitored and optimized objectively.

Experimental procedure

1. Principle of the measurement

The heart of the optical scanning analyser, Turbiscan®, is a detection head, which moves up and down along a flat-bottom cylindrical glass cell (Figure 1)[1-2]. The detection head is composed of a pulsed near infrared light source (λ = 880 nm) and two synchronous detectors. The transmission detector (at 180°) receives the light, which goes through the sample, while the backscattering detector (at 45°) receives the light scattered backward by the sample. The detection head scans the entire height of the sample, acquiring transmission and backscattering data every 40 µm. The Turbiscan LAB can be thermo-regulated from 4 to 60°C and linked to a fully automated ageing station (Turbiscan ags) for long-term stability analyses. Increasing temperature is the ideal parameter to accelerate destabilisation processes, while maintaining realistic testing conditions.

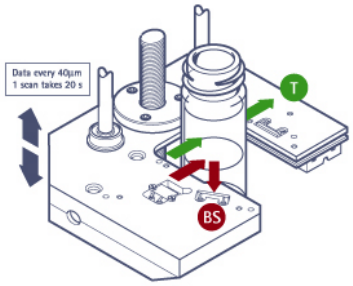

Figure 1. Principle of Turbiscan® measurement