



Study of the slow breaking of a foam

Quick and simple foam characterisation

Application

Cosmetics

Objective

Characterization of a shaving foam and its breaking

Device

TURBISCAN® LAB

INTRODUCTION

Foams can be assimilated to gas in liquid emulsions. They are very unstable products and their life span does not exceed the few minutes of its application. In the case of shaving foams, the breaking of the product has to be sufficiently slow to enable a good protection of the skin during the shaving process. Therefore the kinetics of breaking is a fundamental parameter for the formulator. However, this characterization is very difficult to perform due to the fragility of the system.

With using the Turbiscan LAB it is possible to study the kinetics of breaking of such products.

METHOD

We analyse a commercial shaving foam using the Turbiscan LAB with the "scan" mode (acquisitions every 40µm along the measurement cell for each scan – scans performed every minute during three hours).

We let the foam break until the process ends: we obtain the liquid phase and can determine its refractive index (using a refractometer). Moreover, as we measure the initial sample volume and the final liquid volume (when no more air is dispersed in the continuous phase), we can determine the air volume fraction in the foam.

RESULTS

1. Analysis of the bubbles diameter

From backscattering measurements (Figure 1), the Turbiscan LAB^{expert} calculates the bubbles mean diameter. The values to enter in the software to allow this calculation are :

- Refractive index of the continuous phase $n_p = 1.335$
- Refractive index of the dispersed phase $n_f = 1$ (air)
- Volume fraction of the dispersed phase $\phi = 90\%$ (calculated with the initial sample volume and the final liquid volume when the foam is broken)

It is therefore possible to calculate the kinetics of coalescence of the air bubbles to follow the breaking of the foam (Figure 2).

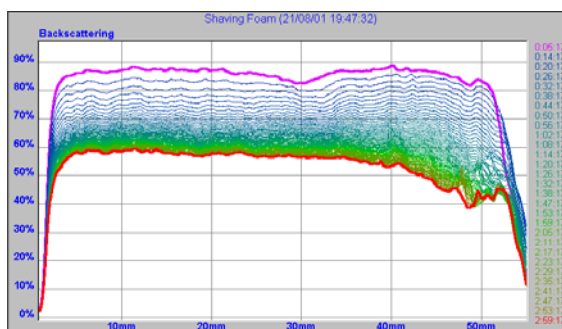


Figure 1. Backscattering versus sample height