



Application

Liquid dispersions
(Particles and droplets tend to flocculate / coalesce).

Objective

Analyse influence of various parameters on the stability of emulsions:

- Surfactant ;
- Concentration ;
- Temperature.

Device

Turbiscan® AGS
Turbiscan® TOWER

Using the Turbiscan Stability Index (TSI) to determine surfactant efficiency on emulsions stabilisation

Introduction

Emulsions are unstable colloidal systems that undergo many destabilization phenomena (coalescence, flocculation, creaming, etc.) that can be due to various causes (lack of surfactant to cover the interface, attractive forces, etc.). Therefore, it is very important for the formulator to know the origins of these processes to be able to overcome them to get a stable product.

For many reasons (coexistence of small and big droplets, chemical interactions, ...) droplets tend to flocculate. The addition of surfactants may minimize these problems. In this study we have investigated how different surfactants influence flocculation of droplets, as well as the effect of surfactant concentration and the temperature of storage.

Measurement Protocol

An O/W emulsion was formulated using oil (triglyceride) and 1% of xanthan, and one of the 2 additional surfactants below. The reference emulsion was also studied, without any addition of surfactant.

The surfactant was chosen between these two non-ionic surfactants with different lipophilic chains:

- Tween® 80 (HLB = 15)
- Tween® 65 (HLB = 10.5)

Identification of phenomena

Thanks to the Turbiscan device, destabilization phenomena were identified in these formulations, showing evidence of pure coalescence in the samples, without any particles migration.

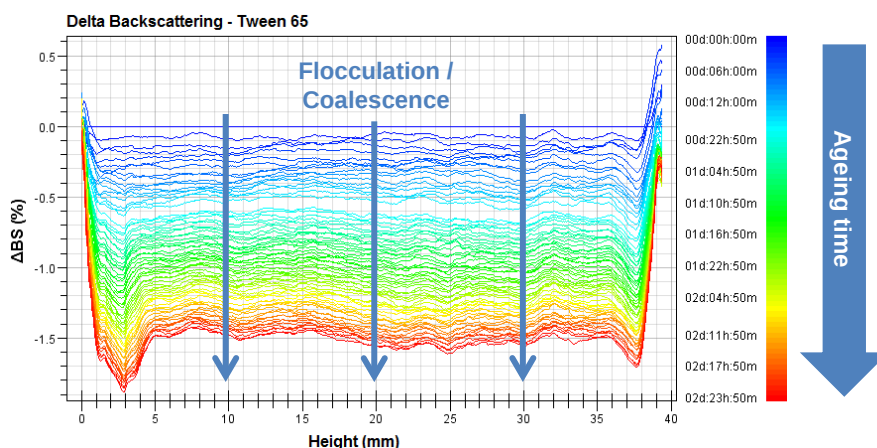


Figure 1. Delta Backscattering, reference emulsion