APPLICATION NOTE

DEVELOPMENT AND CONTROL OF BEVERAGE EMULSIONS

Beverages based on emulsions are very common on the market as they comprise all dairy based drinks and many of the soft drinks, which are diluted emulsions. All these products have relatively short shelf lives and show typical colloidal instabilities (creaming, sedimentation, flocculation, coalescence). Therefore, it is important to test their stability in the less time possible in order to increase the delivery period from the development to the production and, by doing so, follow the expectations of the consumers in the most efficient way.

Application 1: Control of the raw materials.

× **Common method:**

Controlling the quality of raw materials (flavours, stabilisers, gums, *etc.*) for beverage emulsions is of prime importance for both the raw material supplier and the food industry because of the sensitivity of these products towards stability. Therefore, tests have to be performed to ensure the quality of the raw materials. These tests are usually done by preparing reference emulsions (standard emulsion with only the raw material to test changing) and testing their stability visually over several weeks.

The quality control of raw materials can therefore take a few days, holding back the distribution of the batches.

× **Turbiscan® method:**

The Turbiscan LA*b* enables to accelerate stability tests of emulsions prepared with the same standard method as previously mentioned. The equipment also gives the possibility to draw kinetics of instability (migration or particle size variation) and therefore to compare easily newly produced batches to reference values. The thermoregulation (from 4 to 60°C) enables to accelerate the tests even more.

Using the Turbiscan LA*b*, the control tests of raw materials are accelerated up to 30 times, enabling to increase the production capacity and to improve the reliability of the products.

Application 2: Development of a new beverage.

× **Common method:**

When developing a new drink, the formulator has a list of specifications from the marketing that he needs to fulfil, with all the physico-chemical issues that can arise with mixing different kind of raw materials (*e.g.* milk and orange juice). Because of the large complexity of the systems, the most widely spread method to measure the stability of food product is the visual observation of the samples at different temperatures during several months. However, this is a very subjective and tedious test that leads to long delivery time of new products.

× **Turbiscan® method:**

The Turbiscan LA*b* enables to identify and monitor the stability of colloidal dispersions in only a few days. It is a very helpful tool for the formulator as it gives a real insight on the instability taking place (migration and/or particle size increase) and enables to quantify it through parameters such as migration velocity and flocculation rate. It then becomes easier to test the effect of different ingredients, stabilisers and obtain the most robust and stable formulation in less time.

The Turbiscan LA*b* enables a quick and objective measurement of the stability of beverage emulsions, shortening significantly the development time of new drinks.

APPLICATION NOTE

Application 3: Detection of the ring in soft drinks.

× **Common method:**

The formation of a ring at the top of the drink is one of the major rejecting parameter for the consumers. Indeed, when dealing with soft drink that are made by diluting a concentrated emulsion, creaming is very common, hence the ring formation. Few efficient techniques exist to measure this ring and it is often left to the visual inspection of the samples, with all the subjectivity and the lack of accuracy that the method implies.

The control of the formation of a ring at the top of a drink is done by visual observation, which is tedious, inaccurate and time consuming.

× **Turbiscan® method:**

The Turbiscan LA*b* allows a detection of the ring formation in less than one day, with good accuracy. The control can be automated using the ageing station, Turbiscan ags, and the set of a warning level that enables a quick and easy recognition of the unstable samples.

Using the Turbiscan ags, control of the ring formation of soft drink is automated and accelerated significantly with more accurate and objective data.

All these different tests, corresponding to various steps of the development of a beverage emulsion, are done with the same equipment, the Turbiscan LA*b*, and concern both the R&D laboratories developing new drinks and the quality control laboratories controlling products after production. These tests can also be used for raw material suppliers as a selling tool to show the efficiency of their products to their customers.