

THE STEP TECHNOLOGY (Space & Time Extinction Profile)

ANÁLISIS ACELERADO DE ESTABILIDADES FÍSICAS DE EMULSIONES, DISPERSIONES,... Predicción shelf life a gravedad en pocas horas d'ensayo

-Tecnología patentada STEP(Space and Time Extinction Profile), análisis de la transmisión de la luz que sucede durante la separación de emulsiones y dispersiones aceleradas por campo centrífugo o simplemente a gravedad.

-Rápido análisis para laboratorios de I+D, producción y calidad con capacidad hasta 12 muestras(0,1-0,5 ml. es suficiente) en el mismo ensayo.

-Directa, rápida, objetiva caracterización de los fenómenos de demixing o separación de fases.

-Información en minutos y horas en lugar de meses y años. Consolidación o terminación de los procesos de separación. Correlaciones para determinar la **shelf live** -del producto a gravedad.

-Información de la estabilidad real 5000 veces más rápida que otros métodos.

-PSD: Distribución del tamaño de partícula y información sobre distribución de partícula sin necesidad de conocer las propiedades de los materiales.

- Adecuado para emulsiones, suspensiones concentradas y diluidas, dispersiones,....

- Amplio ratio de viscosidades.

Caso real

•COTYASTOR : The formulation of a distinctive skin care product R. Moyon, K. Golz, L. Zastrow

Cosméto-Scientifique—SCC Chapitre du Québec
Volume 8, N°3—Mai 2007

The measurement cycle to extrapolate the shelf life for the product at room temperature during three years, is shorter and take only 15 hours.

The principle (Fig.1) is based on the transmission of a light signal close to infra red, coupled with a centrifugation system with a centrifugal force 1000g at a rotation speed of 3000rpm at a temperature of 35°C (1).

Software (SEPView) records the transmission intensity of a sample in terms of time and position in order to draw a "transmission profile" (Fig.2).

The additional advantages from this instrumental method, apart from being time-saving, are: the small quantity needed to analyze: only 0,5ml, and the possibility to assess eight samples during one cycle.

The profile interpretation is immediately obtained and the creation of a references data base is not needed. The results are immediate, accurate and could be correlated by visual observation of measurement cells.

Neither the "benchmark" nor the "prototype" showed changes in appearance, in color, in odor or in texture.

Thus, the products seem stable.

Texture assessment:

We have also two kinds of test to characterize formula textures:

a subjective test based on panel answers (2), and an objective test based on measurement by a Texture Analyzer TA-XT Plus 5kg (Stable MicroSystem) (3).

Sensory assessment is ore and more use by cosmetic companies to characterize emulsions and it would seem to be a relevant tool to complete the development procedure for new skin care products.

Each formula is proposed to a panel of ten women between 25-35 years old to assess their sensory properties, I.e. their respective texture and skin feel (Coty procedure).

Esquema de funcionamiento

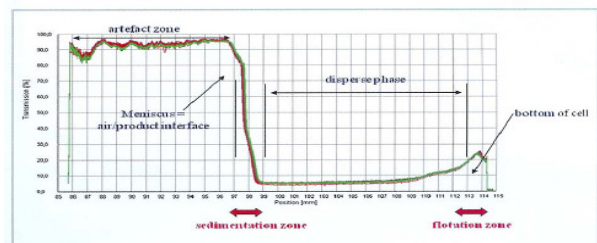
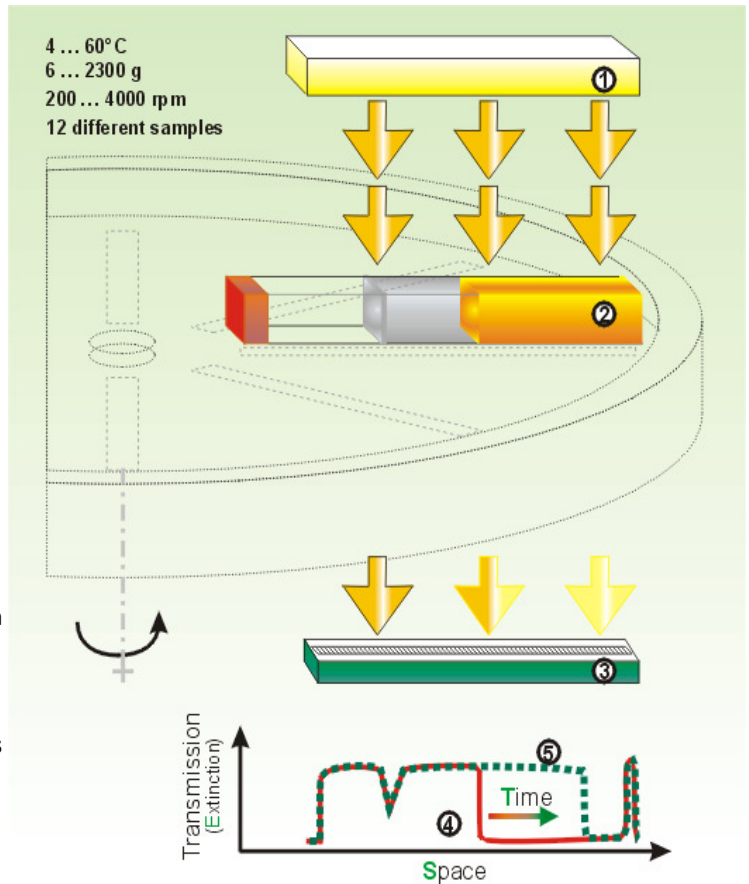


Fig. 2 The classic transmission profile

Reference sample	Sedimentation Calculation		Extrapolation 3 Years	Observation cell
	SLOPE (µm/year)	SLOPE (mm/year)		
Prototype	0,0044	0,1368	medium sedimentation, not visible	ok
Benchmark	0,0040	0,1244	medium sedimentation, not visible	ok

Table 2: The LumFuge data

GAMA

CENTRÍFUGOS
-LUMiFuge
-LUMiSizer

Ensayos a distintos rangos de temperatura

Volumenes muestra: 0.1-2 ml
Concentraciones: 0.1-90% vol.
Viscosidades: 0.8-10⁸mPa·s



Stability Analyser
LUMiFuge®

- ✓Very slow separation & demixing pr. (month-years)
- ✓Very stable, very high viscous, very high concentrations
- ✓High throughput with 8 samples measured at once
- ✓SHELF LIFE, STABILITY



Dispersion Analyser
LUMiSizer®

- ✓Very slow separation & demixing pr. (month-years)
- ✓Very stable, very high viscous, very high concentrations
- ✓High throughput with 12 samples measured at once
- ✓PSD, Very small particles or droplets (0.05 µm – 1000µm)
- ✓SHELF LIFE, STABILITY, PSD

GRAVEDAD
- LUMiReader

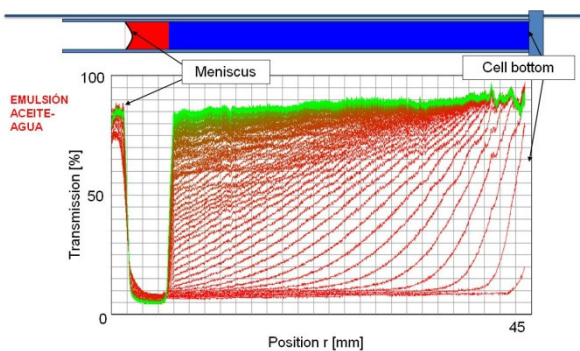
- Ensayos desde Tªambiente a 60°C
- Volumenes muestra: 0.4-4 ml
- Concentraciones: 0.1-75% vol.
- Hasta 3 muestras
- Distintas fuentes de luz (NIR o azul)
- Inclinationes hasta 30°C



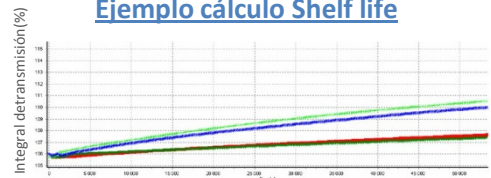
Separation Analyser
LUMiReader®

- ✓Fast separation / demixing processes (mins – hours)
- ✓Fragile / shear sensitive samples
- ✓Analysis under original conditions
- ✓Separation enhancement by inclination up to 10g
- ✓COALESCENCE, FLOCCULATION

Ejemplo de separación emulsión



Ejemplo cálculo Shelf life



Eye-Nose-Cream development	Sedimentation velocity at 2300 xg [µm/sec]	Sedimentation velocity at gravity [µm/d]
A (blue line)	0.109	4.1
B (light green line)	0.111	4.2
Ref. market (red line)	0.047	1.8
C (dark green line)	0.033	1.3

Target OK

NUEVO CONCEPTO EN EL DESARROLLO DE EMULSIONES

1. Determinamos la estabilidad de un referente del mercado que funciona
2. De los desarrollos A, B Y C con distintos sistemas, vemos que la formulación C se ajusta e incluso mejora la estabilidad del sistema que no nos da problemas en el mercado.
3. Continuamos desarrollo con formulación C habiendo resuelto el problema de la estabilidad física de una forma rápida y fiable.