

The **Turbiscan Classic** is able to detect particle migration phenomena in a hours. Furthermore, it allows a quantitative comparison of the results to be made for each sample. It is a useful tool for the formulator who want to optimise the formulation of a paint.

## RESULTS

From the profiles obtained, we can see different kinds of backscattering variation :

- × an important backscattering decrease at the top of both samples, characteristic of a clarification of the products in this zone (*Figure 1 and 2*).
- × a backscattering increase at the bottom of both samples, significant of the sediment layer formation (*Figure 1 and 2*).

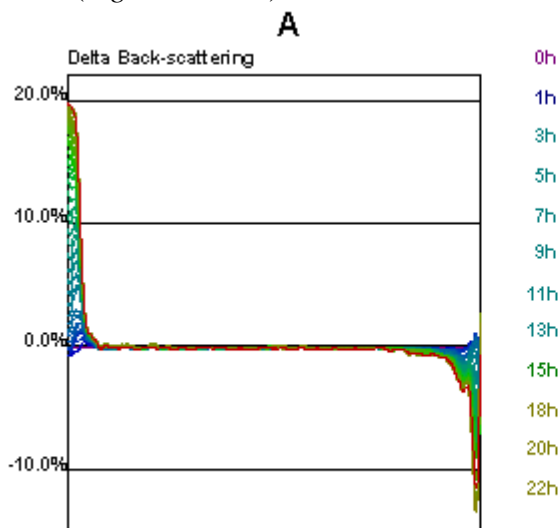


Figure 1

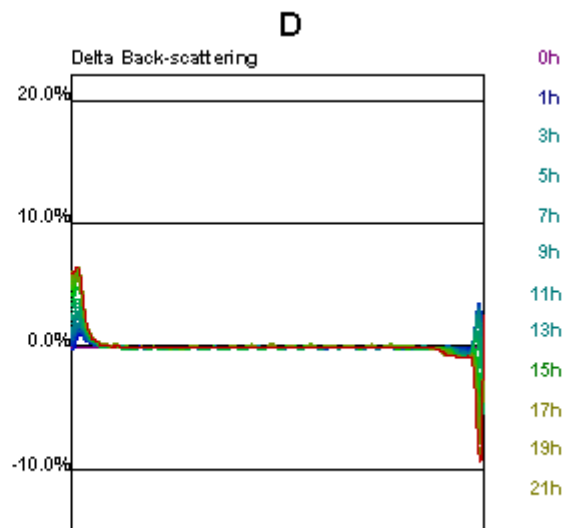


Figure 2

The analysis of the sample bottoms enables to follow the kinetics of backscattering variation as a function of time (*Figure 3*).

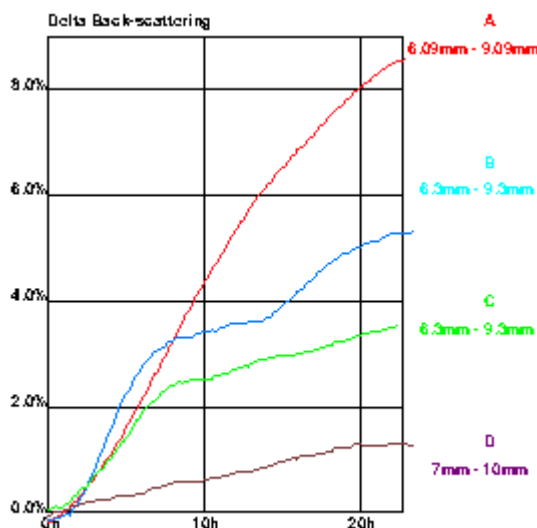


Figure 3

The calculation of the slope of the graph over 20 hours allows the calculation of the paints sedimentation speed (*Table below*).

Paints	Speed (deltaBS/h)	Polymer concentration n	Sedimentation
A	0.40	-	Unstable
B	0.25	+	
C	0.16	++	
D	0.06	+++	Stable

So, the more polymer is introduced into the paint formula, the more the pigment sedimentation is reduced. In fact, the introduction of polymer makes the dispersion thixotropic; *i.e.* increasing the viscosity of the system during storage thus reducing the pigment particle migration and decreasing the viscosity upon stirring to facilitate the application.

By this property, the formulator can create high viscosity paints which are stable during storage and become less viscous during application.

## CONCLUSION

# Effect of the Introduction of Polymer on Pigment Dispersion Stability

## INTRODUCTION

Paint companies produce different pigmented coatings, mechanical and/or chemical properties, which enable them to have a given consistency (thick and stable when unused but then easy to apply) and to adhere on different kind of supports. The incorporation of polymers (binders) in these products allow the cohesion between the different components and so the expected properties to be reached.



Depending on the quantity of polymers added, the stability and the consistency of the products will be affected. Knowing of the polymer quantity to be added allows the formulator to develop a product which is both viscous and stable with the required rheological profile ie. viscosity decrease during application (brushing).

The analysis with the **Turbiscan Classic** enables to study the stability of pigment dispersions as a function of the concentration in polymer.

## SAMPLES PREPARATION AND EXPERIMENT PLAN

Four dispersions of phthalocyanin, at different concentrations in polymer.

Samples quantity	4	Temperature of analysis	20°C
Analysed volume	6 ml	Duration of analysis	20 hours

In order to visualise only the back-scattering variations (% , ordinate axis) on the tube height (mm, abscises axis) as a function of time (last curve coloured in red), we draw the “difference curves”. These are obtained by deduction point by point from a curve chosen as the reference. In this case, we have chosen the curve  $t=0$ .