Formulaction

A·R·D

done in collaboration with

TURBISCAN Classic

Application note
AGROCHEMICAL

Formulation of a Concentrated Emulsion for Natural Agrochemical

INTRODUCTION

Oils are used as components of agrochemicals for the treatment of beetroot, maize and wheat as they increase the foliar penetration of the pesticides. For their application, oils have to be dispersed in water by the user in the form of a coarse emulsion of low concentration and stable for a few hours (time of the treatment). The dispersion in water has to be spontaneous. In order to do that, the oils used by the user are pre-formulated and can be found in two formats: emulsifying emulsion (a surfactant solution in oil) or concentrated emulsion (a O/W emulsion at 70 to 80% oil).

The company ARD has formulated a concentrated emulsion with methyl ester of canola seed as oil and a natural surfactant based on sugar as emulsifier. The main constraints of the formulation are the stability of the concentrated emulsion in storage and its ease of the use (fluidity, dilution) as well as the relative stability of the diluted emulsion for the use in the field. The latter has to form spontaneously (without bringing any external energy) and has to be stable during application.
The study of this stability has been done using the **Turbiscan Classic**.

SAMPLE PREPARATION AND EXPERIMENT PLAN

The experimental plan mimics the use of the product.
Samples are prepared directly in the **Turbiscan Classic** cells and analysed quickly.
200µL of concentrated emulsion are added to 5 mL of tap water. The tube is then closed with a stopper and agitated by turning it upside down three times.

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RESULTS

The evolution of the thickness of the transmission peak is followed for two hours (*Figure 1*).
The kinetics of destabilisation are done by constructing the curves of delta transmission (reference curve at t=0, absolute thickness threshold of 2%) as a function of time (*Figure 2*).

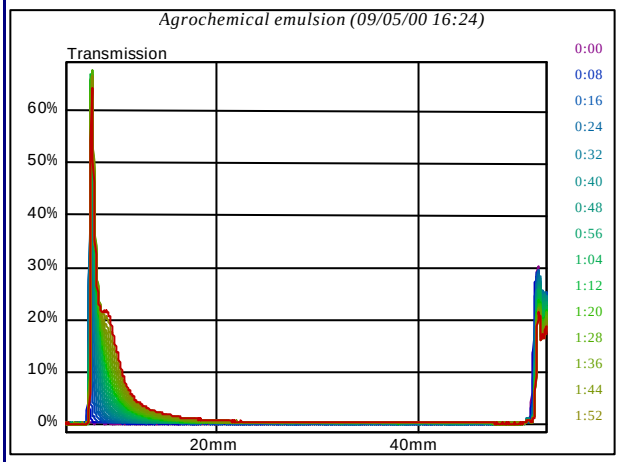

Figure 1 : Evolution of transmission

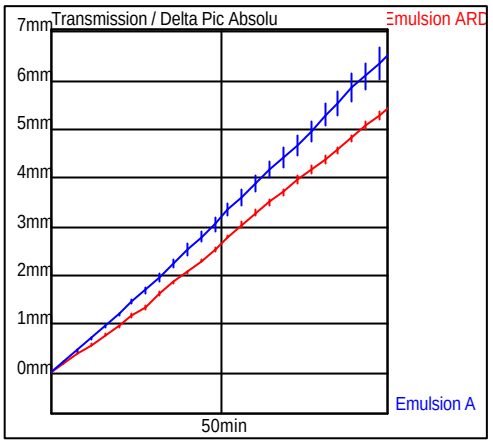

Figure 2 : Kinetics of absolute thickness transmission peak

The destabilisation speeds of diluted emulsions have been determined by calculating the slopes of the curves D**transmission = f(time(min))**. These values are chosen as references in order to compare the formulations prepared and to have an idea of the performance of the product compared to commercial products.

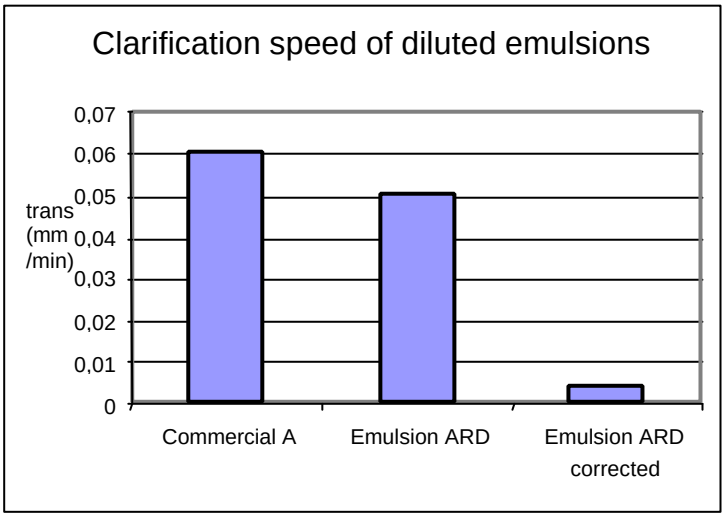

Figure 3 : Clarification speed of diluted emulsions

The results obtained show that the products formulated by ARD are at least as good as commercial products and that the optimization of ARD emulsions gave a better stability of the corrected emulsion compared to the initial one and to the commercial product.

CONCLUSION

These studies on the kinetic of destabilization of diluted emulsions done with the Turbiscan Classic, allowed, very quickly, the determination of the best formulation of an agrochemical component that showed a very good efficiency in the treatment of fields.