



# EFFECT OF ELECTROLYTE INTRODUCTION ON PARENTERAL EMULSION STABILITY

## INTRODUCTION

Lipid injectable emulsions for therapeutic nutrition must cover all the individual needs and are an essential source of fatty acids, as well as a daily source of calories. The therapeutic nutrition can be done with successive or simultaneous administration of lipid emulsion, electrolyte and minerals.

The simultaneous administration of a dispersion containing all the nutrients requires the validation of the compatibility between the nutritive elements and the stability of the lipid emulsion in the dispersion.

These emulsions have been used in the clinical setting for almost 50 years, but despite this, there are no established official standards governing pharmaceutical quality.

The stability of a lipid emulsion with different concentration of calcium chloride ( $\text{CaCl}_2$ ) was evaluated using the Turbiscan technology.

## PRINCIPLE

### Measurement with Turbiscan®

Turbiscan™ instrument, based on Static Multiple Light Scattering, consists in sending a light source (880 nm) on a sample and acquiring backscattered and transmitted signal. Combining both detectors (BS & T) enables to reach wider concentration range. The backward reflected light comes from multiple scattering as the photons scatter several times on different particles (or drop).

[More information](#)

## METHOD

Emulsions of lipid emulsion were prepared by dilution of an injectable emulsion (at 10% in soya oil) and a solution of calcium chloride at different concentration:

- Injectable emulsion (10% in soya oil)
- Calcium chloride in water at 0; 4 and 6 mMol
- Dilution ratio: 1/1 in volume

Emulsion are analyzed using the Turbiscan™ technology by scanning the sample every 10 minutes for a duration of 4 hours

## RESULTS

By scanning the 3 samples according to the method described in the previous paragraph, the following results are obtained:

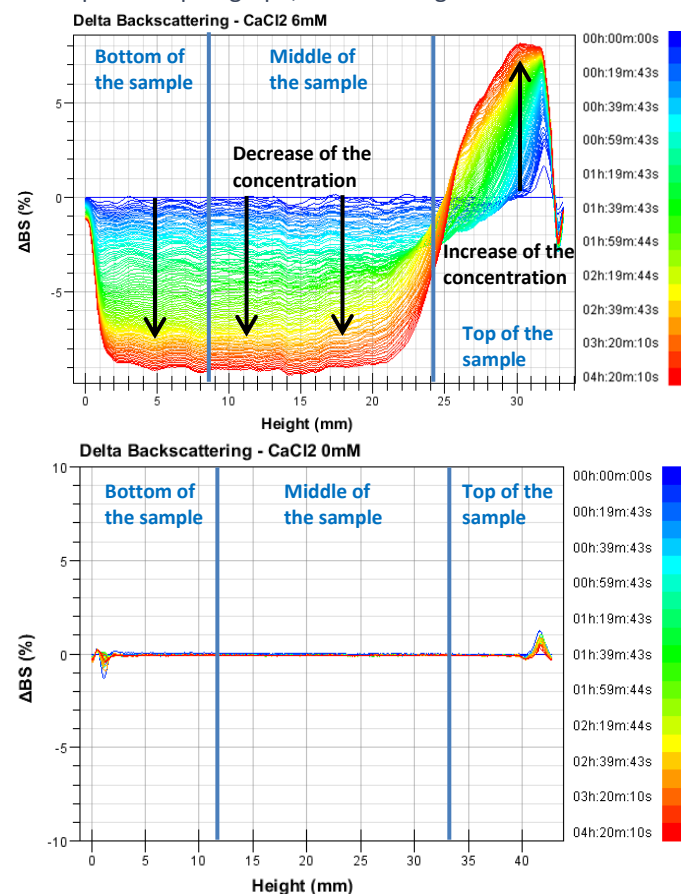


Figure 1&2: Backscattering variation versus sample height for concentration of  $\text{CaCl}_2$  at 6mMol (top) and 0 mMol (bottom)

From the graphs in Figure 1 & 2, we can observe the effect of adding an electrolyte on the emulsion stability. In figure 2 where there is no calcium chloride, no or minor destabilization are observed whereas we can observe the following destabilization when the calcium chloride is added: