



Characterisation of Phase Inversion

METHOD

We have studied the Turbiscan ONLINE sensitivity to a phase inversion. For a direct emulsion (30% hexadecane in water stabilised by the Brij 30 (2%)) at a constant flow rate, the temperature increase generates an inverse emulsion. This process is reversible.

The backscattered and the transmitted light are monitored in real time by the Turbiscan ONLINE. Meantime, the phase inversion is also followed by a classical technique: the conductivity.

Application

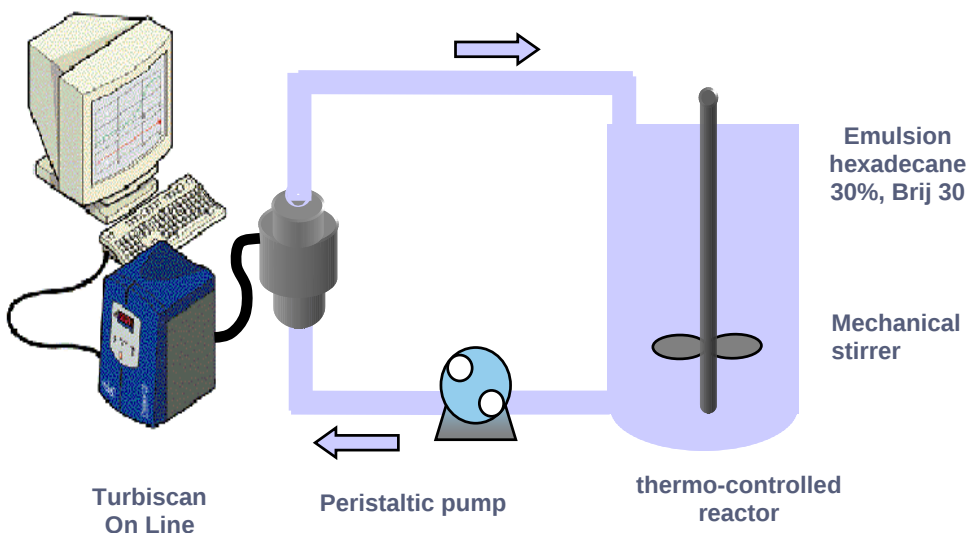
All domains

Objective

Determine phase inversion temperature

Device

TURBISCAN® ONLINE



RESULTS

Figure 1, in the first step by progressively heating the initial direct emulsion, we see a backscattering decrease that corresponds to a coalescence of the oil droplets (phenomenon that occurs generally just before the phase inversion). During the phase inversion, the emulsion becomes for a short time translucent. That is why we have an peak in transmission.

In the second step, we see an increase of backscattering that corresponds to the emulsification of the water droplets into oil (inverse emulsion).

In the third step, we decrease the temperature and we follow the phase inversion in the other way. The backscattering decreases (droplets coalescence) until the phase inversion where we see again a short transmission increase.

Meantime we monitor the phase inversion by a conductivity measurement. There is a good correlation between the optical measurement and the conductivity. On the other hand the Turbiscan ONLINE can precisely monitor the emulsification process and predict the phase inversion by following the coalescence.