



Stability of petroleum oil

Application

Petroleum

Objective

Details various applications of Turbiscan for petroleum products

Device

TURBISCAN® LAB and
TURBISCAN® Classic

INTRODUCTION

Crude oils and heavy fuels are complex colloidal mixtures containing high added value products such as fuel but also many by-products (water, minerals, asphaltenes, etc.). These latter can cause various problems during the oil transformation (aggregation, pipe blockages, emulsion formation, etc.). To overcome these technical issues, chemical additives are used. It is therefore interesting to have a technique that can help identify the most suitable additive, but also to measure accurately the stability of oil or emulsions.

APPLICATION 1: EFFICIENCY OF ADDITIVES FOR DE-EMULSIFICATION

Water is inevitably incorporated in the crude during the extraction. It can also be used to decrease the viscosity of the crude oil and to allow an easier pumping during extraction and transport. However, once the crude has been extracted, water is no longer required and need to be separated from the valuable hydrocarbon part. This process has to be quick but can be significantly delayed due to the presence of surface-active compounds in the crude or various additives used during the extraction (e.g. asphaltenes, corrosion inhibitors).

1. Common method

Bottle tests are used to monitor the efficiency of additives on the de-emulsification of crude oil. They are easy to perform but can take a long time waiting for the full separation and are subject to the judgement of the experimenter who measures the thickness of the phases and in some cases their relative opacity.

Bottle tests are a tedious and subjective exercise that is time consuming.

2. Turbiscan® method

The Turbiscan® enables to replace bottle tests efficiently with its scanning device and its two detectors in transmission and backscattering. Detection of phase separation is therefore much quicker and objective than visual observation. The thermoregulation (up to 60°C) can be used to accelerate the phenomenon even more. Moreover, the opacity or transparency of the phases can be quantified optically and not left to human appreciation. Different samples can be easily compared via kinetics of phase separation.

The Turbiscan® enables to measure the efficiency of additives used for de-emulsification as it sees instabilities much more rapidly and accurately than the eye. This analysis is objective, enabling to compare samples easily.

