Oil Demulsification

Demulsifiers work by neutralizing the effect of emulsifiers, coalescing water droplets, and water-wetting solids to bring about separation and recovery of the maximum amount of oil, and the removal of water and solid impurities.

The purpose of the bottle test is to select the RECOVEROL ECO demulsifier and identify the smallest working concentration, under the conditions applicable in the system. In duplicating the actual system, the operator has to identify the extent and duration of heating and mixing and "expected" settling time, and as closely as possible, use these in the bottle test.

I. MATERIALS

1-2 doz. 100ml bottles
Syringe or pipette
Solvent (75% xylene, 25% propanol, or xylene alone is usually sufficient)
Oven or water bath; (up to 200° F, accurate up to ∀ 2° F.)
Centrifuge (clinical)
Beaker for rinsing
RECOVEROL Demulsifiers
Test Sheet

II. ANALYSIS FOR BASIC SEDIMENT & WATER (BS&W)

- Fill 2 centrifuge tubes to 50% mark with solvent.
- Mix oil sample thoroughly and fill the remainder of the tubes to the 100% mark and mix.
- Add one drop of ECO 91 (50%) to one tube and one drop of ECO 47 (50%) to the other, and mix.
- Heat tubes in oven at 160-180° F until they reach temperature. The actual time varies with each sample (10 min. or more).
- After heating, centrifuge the tubes for 5-10 min.
- Record observations to include amount of water, solids and oil.

III. THE BOTTLE TEST

Having obtained a representative sample of the emulsion, determined the BS&W, and identified the test conditions, proceed as follows:

- Fill test bottles with oil after mixing the sample.
- If heating is required, bring the contents of the bottles to temperature prior to chemical addition (160-180° F optimum).
- Add 1000-3000ppm of ECO demulsifier to each bottle and shake by hand (50-100 times).
- Observe and record immediate changes in emulsion (color, droplet size, and appearance of free water).
- Heat bottles in oven and settle, recording the rate of water separation at periodic intervals.
- Analyze top oil BS&W described in Part II (but do not add ECO). Record oil quality under "Analysis of Treated Phase". Generally good oil quality is <1% BS&W.
- The bottom layer can also be analyzed for oil content as in the above step. Note, when collecting sample from the bottom layer, insert the syringe needle well below the oil layer and wipe any residual oil from the needle before dispensing contents. Failure to do so may result in a false reading. The bottoms should be oil-free.