Instrumental Detergents Test

R-9423

Instrument Calibration

Different instrument platforms vary in their response to the extracting reagent (chloroform) used in this test. To use this test with a spectrophotometer, the analyst must generate an instrument specific calibration at 650 nm, using LAS (linear alkylbenzene sulfonate) as the standard. CHEMetrics recommends the use of the factory calibrated Detergents SAM, Cat. # I-2017, as an alternative to generating an instrument specific curve.

Sample Temperature

Elevated sample temperature will cause a haze to form in the chloroform layer, causing a false positive test result particularly at the low end of the test range. For best accuracy, sample temperature should be ≤ 20°C (68°F).

Test Procedure

1. Rinse the red-tipped plastic dropper bottle with the sample to be tested, then fill it to the fill line with the sample (15 mL).
2. While holding the double-tipped ampoule in a vertical position, snap the upper tip using the tip breaking tool.
3. Invert the ampoule and position the open end over the dropper bottle. Snap the upper tip and allow the contents to drain into the dropper bottle.
4. Cap the dropper bottle and shake it vigorously for 30 seconds.
   NOTE: While shaking the bottle, apply pressure to the red cap with your thumb to ensure that no leaking occurs.
5. Allow the dropper bottle to stand upright and undisturbed for **1 minute**. The layers should separate in the dropper bottle.
   NOTE: During the 1 minute wait, gently loosen the screw cap to release the pressure created by the shaking, then re-tighten the cap.
6. After the 1 minute wait, remove the red cap from the dropper bottle, then gently (slowly) invert the dropper bottle over a test tube and squeeze the bottle to deliver **only** the chloroform layer into the test tube. Stop squeezing when the dark blue layer can be seen in the tapered tip of the dropper bottle.
7. Allow the test tube to stand upright and undisturbed for **4 minutes**.
8. Insert the test tube into the photometer and obtain a reading in ppm (mg/Liter) linear alkylbenzene sulfonate (equivalent weight 325).
   NOTE: The test tube contains chloroform which will easily destroy the photometer sample chamber. Use care to ensure that there is no chloroform residual on the exterior of the test tube before placing it in the photometer. Also use care not to spill the contents of the test tube into the photometer.

Tip Breaker

The tip breaker opens for easy disposal of the glass tips (pull lever away from body of tip breaker or pull open the side wall). The tip breaker will work most effectively if the tips are emptied out frequently.

Test Method

The Instrumental Detergents test employs the methylene blue extraction method[1,2,3]. Anionic detergents react with methylene blue to form a blue complex that is extracted into an immiscible organic solvent. The intensity of the blue color is directly related to the concentration of "methylene blue active substances (MBAS)" in the sample. Anionic detergents are one of the most prominent methylene blue active substances.

1. APHA Standard Methods, 22nd ed., method 5540 C - 2000
2. ASTM D 2330-02, Methylene Blue Active Substances
3. EPA Methods for Chemical Analysis of Water and Wastes, method 425.1 (1983)

Safety Information

Read SDS (available at www.chemetrics.com) before performing this test procedure. Wear safety glasses and protective gloves.

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