

# Filming Amine Vacu-vials® Kit

**K-1013:** 0 - 6.00 ppm (Prog. # 10)

Octadecylamine (ODA) or Oleylamine (OLA)

## Instrument Set-up

For CHEMetrics photometers, follow the **Setup and Measurement Procedures** in the operator's manual. For spectrophotometers, follow the manufacturer's instructions to set the wavelength to **560 nm.** and to zero the instrument using the ZERO ampoule supplied.

## Sample Temperature

Sample temperatures that deviate significantly from 20°C (68°F) may introduce test result bias.

## Test Procedure

1. Rinse the sample cup with the sample to be tested, then fill it to the 20 mL mark with the sample (fig. 1).
2. Add 10 drops of S-1010 Acidifier Solution (fig. 2). Stir to mix the contents of the cup.
3. Place the Vacu-vial ampoule, tip first, into the sample cup. Snap the tip. The ampoule will fill leaving a tiny bubble for mixing (fig. 3).
4. Tap the bottom of the ampoule on a hard surface to cause any tiny bubbles that have collected on the ampoule wall to rise to the top of the liquid in the ampoule. Mix the ampoule by repeatedly inverting it, allowing the bubble to travel from end to end until a uniform color is obtained.
5. Dry the ampoule. Obtain a test result **2 minutes** after snapping the tip.

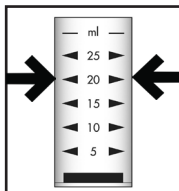


Figure 1

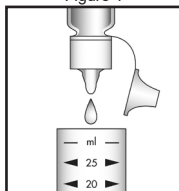


Figure 2

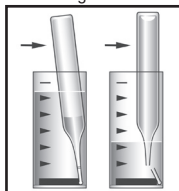


Figure 3

6. Insert the Vacu-vial ampoule into the photometer, flat end first, and obtain a reading in ppm (mg/Liter) ODA or OLA.

**NOTE:** If using a spectrophotometer that is not pre-calibrated for CHEMetrics products, then use the **equation below** or the **Concentration Calculator** on the website.

$$\text{ppm ODA or OLA} = 5.93(\text{abs})^3 - 6.08(\text{abs})^2 + 11.57(\text{abs}) - 0.26$$

## Test Method

The Filming Amines Vacu-vials®<sup>1</sup> test kit employs the Rose Bengal chemistry. When samples are buffered under acidic conditions (pH 2.3 - 3.3), filming amines such as Octadecylamine (ODA) and Oleylamine (OLA) form a magenta complex with rose bengal (4,5,6,7-tetrachloro-2',4',5',7'-tetraiodofluorescein disodium salt) in direct proportion to the concentration of filming amines present in the sample. Various ions typically used for treatment of boilers may cause negative interference. Samples with high total alkalinity contribute to positive interference.

1. *Vacu-vials* is a registered trademark of AquaPhoenix Scientific, LLC U.S. Patent No. 3,634,038
2. K Stiller, T Wittig, M Urschey. "The Analysis of Film-Forming Amines - Methods, Possibilities, Limits and Recommendations" (2010)

## Sampling

Sampling technique is critical. Samples should be cooled to prevent flashing. Sample lines should be flushed thoroughly before sampling. Sampling points should be representative of the system. Filming amines will attach to the surfaces of sample containers. Rinse the sample cup thoroughly with distilled water between uses. Washing the cup after every test is not essential; however, periodic cleaning with standard laboratory detergent or routine replacement of the sample cup is recommended. Sample directly into the clean sample cup.

## Safety Information

Read SDS before performing this test procedure. Wear safety glasses and protective gloves.