



# Technical Data Sheet

## Detergents (Anionic Surfactants, MBAS) Methylene Blue Method

**Applications and Industries:** Stormwater, glassware rinsate, drinking water, pharmaceutical cleaning validation

**References:** APHA Standard Methods, 22<sup>nd</sup> ed., Method 5540 C - 2000. EPA Methods for Chemical Analysis of Water and Wastes, Method 425.1 (1983). ASTM D 2330-02, Methylene Blue Active Substances.

**Chemistry:** Methylene blue active substances (MBAS) bring about the transfer of methylene blue, a cationic dye, from an aqueous solution into an immiscible organic solvent. This occurs through ion pair formation by the MBAS anion and the methylene blue cation. The intensity of the blue color in the organic solvent is directly related to the concentration of MBAS in the sample. Anionic surfactants commonly used in commercially available detergent formulations are prominent methylene blue active substances, and are strongly responsive to this chemistry. Test results are expressed as ppm (mg/L) linear alkylbenzene sulfonate (LAS).

### Interference Information:

This test is designed for the measurement of anionic surfactants. Positive interferences result from all other MBAS species.

The test does not measure cationic or non-ionic surfactants; however, cationic detergents and other cationic compounds (e.g. amines) may cause a negative interference by competing with methylene blue in the formation of ion pairs.

Organic sulfonates, sulfates, carboxylates, phosphates, and phenols as well as inorganic cyanates and thiocyanates may interfere.

Sulfides may interfere negatively.

Nitrate interferes positively; 10 ppm NO<sub>3</sub>-N may read as approximately 0.2 ppm.

Isopropanol at up to 0.1% does not interfere.

Chloride at up to 100 ppm does not interfere significantly. However, because higher chloride levels will interfere positively, this test kit is not recommended for the analysis of brine or seawater samples unless additional sample manipulation is performed. CHEMetrics' Technical Services staff can provide additional information upon request.

**NOTE:** It is recommended that only the components contained in each kit be used to perform these tests. The reaction tube contained in the visual colorimetric CHEMetrics® test kit is made of polypropylene and the dropper bottle contained in the Instrumental test kit is low-density polyethylene. Use of tubes or bottles made of various other polymers (including polystyrene) is discouraged, as the chloroform in the test reagents may react with these containers.

**Safety Information:** Safety Data Sheets (SDS) are available upon request and at [www.chemetrics.com](http://www.chemetrics.com). Read SDS before using these products. Breaking the tip of a CHEMet™ ampoule in air rather than liquid may cause the glass ampoule to shatter. Wear safety glasses and protective gloves.

**Available Analysis Systems:** Visual colorimetric: CHEMetrics® Kits. Instrumental colorimetric: Single Analyte Photometer (SAM) Kit.

**Storage Requirements:** Products should be stored in the dark and at room temperature.

**Shelf Life:** *When stored in the dark and at room temperature:* Visual colorimetric: The R-9400 CHEMetrics refill has a shelf life of 5 months. The R-9404 CHEMetrics refill has a shelf life of 8 months. The color comparators have 2-year shelf lives. Instrumental colorimetric: The Instrumental refill has a shelf life of 8 months.

**Accuracy:** CHEMetrics kits: ± 1 color standard increment; Single Analyte Photometer kit: ± 30% error at 0.25 ppm, 0.63 ppm, and 1.88 ppm.