

A Glossary of Analytical Chemistry Terms with Special Reference to Quality Control & Analysis

Acid-Soluble Metal - That portion of the metal concentration that will pass through a 0.45 mm membrane filter after the solution to be filtered has been adjusted to within a pH 1.75 +/- 0.1 and held for a period of 16 hours.

Calibration Blank - A volume of ASTM type I water acidified such that the concentration of acid(s) is identical to the concentration of acid(s) in the calibration standards. Keep in mind that not all analyses use acidified matrices so the calibration blank and standards would not be acidified.

Calibration Standard (CAL) - A solution prepared from a stock standard solution which is used to calibrate the instrument response with respect to analyte concentration.

Continuing Calibration Blank (CCB) - A blank analyzed after the CCV to show any contamination or carryover. This value should be less than the practical detection limit.

Continuing Calibration Verification (CCV) - A mid-range calibration standard that is analyzed periodically during sample analyses.

Dissolved - Material that will pass through a 0.45 mm membrane filter assembly prior to sample acidification.

Field Duplicates - Two separate samples collected at the same time and place under identical circumstances and treated exactly the same throughout field and laboratory procedures. Analyses of both samples give a measure of the precision associated with sample collection, preservation and storage, as well as with laboratory procedure.

Field Reagent Blank (FRB) - A sample container that is treated as a sample in all respects, including exposure to sampling site conditions, storage, preservation and all analytical procedures. The purpose of the FRB is to determine if method analytes or other interferences are present in the field environment. This sample usually consists of the blank material, such as deionized water, that is passed through the sampling equipment at the field sampling site.

Instrument Detection Limit (IDL) - The concentration equivalent of an analyte signal equal to three times the standard deviation of the calibration blank signal at the selected absorbance line.

Laboratory Duplicates - Two aliquots of the same sample taken in the laboratory and analyzed separately with identical procedures. Analyses of both samples indicates

precision associated with laboratory procedure, but not with sample collection, preservation or storage.

Linear Dynamic Range (LDR) - The concentration range over which the analytical working calibration curve remains linear.

Laboratory Control Sample (LCS) - One of the calibration standards run as a sample. The recovery must be within a range specified by Quality Assurance Plan of the laboratory.

Laboratory Fortified Blank (LFB) - An aliquot of reagent water acidified, if necessary, to match the matrices of the sample and standards, to which a known quantity of each method analyte is added in the laboratory. The LFB is analyzed exactly like a sample and its purpose is to determine whether the method is within accepted control limits. Sometimes these samples are referred to as "spiked blanks".

Laboratory Fortified Sample Matrix (LFM) - An aliquot of an environmental sample to which a known quantity of each method analyte is added in the laboratory. The LFM is analyzed exactly like a sample and its purpose is to determine whether the sample matrix contributes bias, such as interferences, to the analytical results. These are often referred to as "spiked" samples or "matrix spike samples".

Laboratory Reagent Blank (LRB) - An aliquot of reagent water that is treated exactly as a sample including exposure to all glassware, equipment, and reagents that are used with samples. The LRB is used to determine if method analytes or other interferences are present in the laboratory environment, reagents or apparatus.

Material Safety Data Sheet (MSDS) - Information provided by vendors concerning a chemical's toxicity, health hazards, physical properties, fire, and reactivity data including storage, spill and handling precautions.

Maximum Contaminant Level (MCL) - The maximum allowable concentration of a drinking water contaminant as legislated through the Safe Drinking Water Act.

Maximum Contaminant Level Goal (MCLG) - The future target MCL for an analyte.

Method Detection Limit (MDL) - The minimum concentration of an analyte that can be identified, measured and reported with 99% confidence that the analyte concentration is greater than zero.

Practical Detection Limits (PDL) - The minimum concentration of an analyte that can be reliably identified, measured and reported with complete confidence that the analyte concentration is greater than zero. Laboratories use various methods for determining this value for each analyte. It is usually a greater value than the MDL and is often referred to as the "reporting limit."

Quality Assurance Plan (QAP) - The document that outlines, defines and provides guidance for the operation of a laboratory. This document generally contains, but is not limited to, information pertaining to: laboratory personnel, sampling procedures and sample rejection criteria, sample handling and chain of custody routines, the equipment employed by the laboratory, analytical methods, data reduction, validation and reporting, calibration and quality control procedures, equipment maintenance, routine procedure for precision and accuracy, method validation, verification and corrective actions, health and safety policy and training.

Quality Control Sample (QCS) - A solution containing a known concentration of each method analyte derived from externally prepared test materials. The QCS is obtained from a source external to the laboratory and is used to check laboratory performance. This is sometimes called an Initial Calibration Verification (ICV).

Secondary Maximum Contaminant Level (SMGL) - The maximum allowable concentration of a drinking water "secondary" contaminant as legislated through the Safe Drinking Water Act. Secondary contaminants may be thought of as affecting the esthetic qualities of drinking water. Examples include iron providing a "metallic" taste and levels of fluoride that cause brown mottling of teeth.

Standard Addition - The addition of a known amount of analyte to the sample in order to determine the relative response of the detector to an analyte within the sample matrix. The relative response is then used to assess the sample analyte concentration.

Stock Standard Solution - A concentrated solution containing one analyte prepared in the laboratory using an assayed reference compound or purchased from a reputable commercial source.

Total Recoverable - The concentration of analyte determined on an unfiltered sample following treatment with hot dilute mineral acid. (We use acidic microwave digestion methods for much of this type of work).

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