Topics in IH Chemistry
Blank Correction of Air Samples
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Background Blanks

Many air sampling tests require the analysis of an associated background Blank, consisting of analysis of Sampling Media that has not been exposed to a Sampling Event. When a background Blank is found to be detectable, the Blank Value from analysis should be subtracted from each Sample Value. Since no Sampling Event occurred, any detectable Blank Value must be attributed to extrinsic factors (i.e. factors other than the environment sampled during the Sampling Event) and subtracted Blank Corrected Value that is expected to be more accurate measure of the environment sampled.

One should be aware that detectable Blank values may arise from contamination of Extraction Fluid, or of Sampling Media, by the Analyte of interest. (Or, by a contaminant that the measuring instrument cannot distinguish from Analyte.) Further, one should also be aware that extrinsic contamination of Sampling Media may occur prior to field arrival, during field operations, during return, during Lab Analysis after the Sample has returned.

Assay Technology Lab Practices

In the Assay Technology Lab, two separate Blanks are commonly analyzed in the same analytical run with live samples that have been exposed in a Sampling Event.

Lab Reagent Blank – A sample of Extraction Fluid (solvents, reagents, buffer, etc.) from the same Batch as that used to extract the Sampler (sampling media)

Lab Media Blank – The extract of an unexposed Sampler (sampling media) using the same Reagent Batch and Media Batch as used for corresponding live Samples.

In the Assay Technology Lab, when Blank values are found detectable, all results are Blank Corrected.

Field Blanks

In traditional IH practice, Field Blanks consist of Sampling Media taken into the field and handled as regular samples (but not exposed to a Sampling Event), then returned to the Lab for analysis. Field Blanks have been characterized as allowing the field IH to make a correction for any contamination that may arise in the Sampling Media whether it occurs prior to, during, or after the sampling event.

Due to improvements in laboratory practices (e.g., those cited above), and due to improvements in packaging and stability of sampling media, Field Blank Values nowadays are likely to be non-detectable, indicating no need for a correction.

However, certain analytes (e.g. formaldehyde, nitrogen oxides, carbon oxides, and ozone), are so ubiquitous in the environment that contamination can easily occur outside the sampling environment. In such instances, a Field Blank can provide a correction for any extrinsic contamination which may occur in the field, but outside of the sampling event.

In evaluating the significance of any Blank Correction, or imputed error, it is often helpful to express the Sample Value and the Blank Value as a % of the Permissible Exposure Limit (PEL).