


Chapter 6



Sampling & Analysis



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TCLP Questions

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TCLP Requirements for the Method of Standard Addition

Question: What are the requirements for performing the method of standard addition when analyzing TCLP extracts for lead by Method 6010B?



Answer: The criteria for the method of standard addition (MSA) are outlined in Sec. 8.4 of Method 1311. In general, when the recovery of the matrix spike is less than 50%, and the analyte of concern is within 20% of the regulatory concentration, the sample must be quantified by MSA. This requirement applies to all TCLP inorganic analytes and the methods used to determine those analytes, including TCP Method 6010B. Generally, most samples will not have to be analyzed by MSA, given the criteria listed in the method. However, the laboratory may choose to apply tighter criteria than those described in the method.

Total Constituent Analysis Instead of TCLP Analysis

Question: Is it acceptable to perform a total constituent analysis instead of a TCLP analysis and then divide the total concentration by 20 to determine if a waste is non-hazardous, as is implied in Section 1.2 of Method 1311, TCLP?

Answer: Section 1.2 of the TCLP *does* allow for a total constituent analysis in lieu of the TCLP extraction. If a waste is 100% solid, as defined by the TCLP method, then the results of the total constituent analysis may be divided by twenty to convert the total results into the maximum leachable concentration. This factor is derived from the 20:1 liquid-to-solid ratio employed in the TCLP. If a waste has filterable liquid, then the concentration of the analyte in each phase (liquid and solid) must be determined. The following equation may be used to calculate this value:

$$\frac{[A \times B] + [C \times D]}{B + [20 (L/kg) \times D]} = E$$

Where:

- A = Concentration of the analyte in liquid portion of the sample (mg/L)
- B = Volume of the liquid portion of the sample (L)
- C = Concentration of the analyte in solid portion of the sample (mg/kg)
- D = Weight of the solid portion of the sample (kg)
- E = Maximum theoretical concentration in leachate (mg/L)

The value obtained (E) can be used to show that the maximum theoretical concentration in a leachate from the waste could not exceed the concentration specified in the toxicity characteristic (TC) (40 CFR 261.24).

In addition, if the total constituent analysis results themselves are below the TC limits without dividing by 20, then the same argument holds true, i.e., the maximum theoretical concentration in the leachate could not exceed the TC limits.