A2LA Assessor Environmental Method Checklist

Platform Graphite Furnace Atomic Absorption

Item	Section 1 - Personnel	Reference	Yes-No or NA	
1.1	Does the analyst(s) interviewed meet the job description position requirements, training and qualifications for performing the test? Supervisor:_____ Technician:_____	(G25)6.1		

Item	Section 2 - Equipment & Facilities	Reference	Yes-No or NA	
2.1	Is a graphite furnace spectrometer equipped with programmed heating of the graphite tube, associated delayed atomization device and recirculating refrigeration system?	(ORDM)200.9,6.1.1 (5/94)		
2.2	Is the background correction device adequate for removing non-specific absorbance and avoiding interelement spectral overlap interferences?	(ORDM)200.9,6.1.1 (5/94)		
2.3	Is an alternative gas mixture consisting of 5% hydrogen and 95% argon used in the furnace during the drying and charring furnace cycles?	(ORDM)200.9,6.1.1 (5/94)		
2.4	Is the recorder capable of capturing fast transient signals (<1 second)?	(ORDM)200.9,6.1.1 (5/94)		
2.5	Is a single element hollow cathode lamp or single element electrodeless discharge lamp available for each element?	(ORDM)200.9,6.1.2 (5/94)		
2.6	Is an autosampler used to inject samples, matrix modifiers and completing methods of standard addition?	(ORDM)200.9,6.1.5 (5/94)		

Item	Section 3 - Method	Reference	Yes-No or NA	
3.1	Is glassware cleaned by washing with a detergent solution, rinsing with tap water, soaking for 4 hours or more in 20% (v/v) nitric acid or dilute mixture of nitric and hydrochloric acid (1+2+9), rinsing with reagent water and storing clean?	(ORDM)200.9,6.10 (5/94)		
3.2	Are all reagents high purity, conforming to ACS specifications and are all acids ultra high purity grade or equivalent. Are they analyzed for contamination if purity is in question?	(ORDM)200.9,7.1 (5/94)		
3.3	Is ASTM Type I water used for reagent water?	(ORDM)200.9,7.4 (5/94)		
3.4	Is the matrix modifier analyzed separately to assess the contribution of the modifier to the absorbance of calibration and reagent blank solutions?	(ORDM)200.9,7.7 (5/94)		
3.5	Is the acid diluent 1% nitric acid for dissolved elements in water and for direct analysis of drinking water with turbidity <1 NTU?	(ORDM)200.9,7.9 (5/94)		
3.6	Is the acid diluent for total recoverable elements 2% nitric and 1% hydrochloric acid in water and 2% nitric and 2% hydrochloric in solid samples?	(ORDM)200.9,7.9 (5/94)		
3.7	Are the calibration standards prepared as needed or every two weeks at levels appropriate to the operating range?	(ORDM)200.9,7.9 (5/94)		
3.8	Are four blanks (calibration blank, laboratory reagent blank, laboratory fortified blank, and a rinse blank) analyzed as part of the method?	(ORDM)200.9,7.10 (5/94)		
3.9	Is the linear dynamic range for the wavelength for each analyte determined using a minimum of six different concentration standards across the range?	(ORDM)200.9,9.2 (5/94)		
3.10	Is the charring temperature limit for each analyte determined by conducting a char temperature profile to obtain the optimum operating conditions for providing the lowest reliable MDL, similar to those listed in the method?	(ORDM)200.9,10.2 (5/94)		
3.11	Is preconcentration using multiple aliquot depositions on the GFAA platform performed with: the same number of equal volume aliquots of standards and sample, equal volumes of matrix modifers and completion of the drying cycle before the next addition, in order to achieve lower MDLs when analyzing drinking water with turbidity of <1 NTU?	(ORDM)200.9,10.5 (5/94)		
3.12	Is aqueous total recoverable sample preparation performed on a hot plate at 85°C for about 2 hours (when using a 100 mL aliquot of sample) followed by covering with a watch glass and a 30 minute gentle reflux ?	(ORDM)200.9,11.2.4 (5/94)		
3.13	Is the hot plate temperature adjusted so that an uncovered beaker containing 50 mL of water placed in the center maintains a temperature of no higher than 85°C?	(ORDM)200.9,11.2.3 (5/94)		

3.14	Is the calculation of dry weight based on percent solids dried at 60°C to a constant weight to avoid the loss of volatile metallic compounds or does the data user, program or laboratory report percent solids by drying to 105°C?	(ORDM)200.9,12.5 (5/94)		
3.15	Is the sample size for solid sample preparation adjusted based on the moisture content of the solid and is the final data reported to indicate wet weight or dry weight concentration at the temperature measured?	(ORDM)200.9,11.3.1 (5/94)		
3.16	Are solid samples for RCRA reported as wet weight?	(SW846)7000A,7.4.3 (7/92)		

Item	Section 4 - Sample Handling Practices	Reference	Yes-No or NA	
4.1	Is the pH of all aqueous samples checked to be less than 2 prior to aliquoting for processing or direct analysis to ensure the sample has been properly preserved?	(ORDM)200.9,8.1 (5/94)		
4.2	Are samples for dissolved elements filtered in the field using glass or plastic filtering apparatus and is the filtrate preserved with (1+1) nitric acid to a pH < 2?	(ORDM)200.9,8.2 (5/94)		
4.3	Are samples preserved with (1+1) nitric acid to pH < 2 at the time of collection or shipped to the laboratory and preserved within two weeks of collection and analysis started only after being held preserved for 16 hours?	(ORDM)200.9,8.3 (5/94)		
4.4	Are solid samples preserved by storing at 4°C with no holding time limitation?	(ORDM)200.9,8.4 (5/94)		
4.5	Are all sample containers prewashed with detergents, acids and reagent water and are they made of either plastic or glass?	(SW846)7060A,6.2 (9/94)		
4.6	Are all aqueous samples acidified to pH < 2 with nitric acid and refrigerated prior to analysis?	(SW846)7060A,6.4 (9/94)		

Item	Section 5 - Quality Control Practices	Reference	Yes-No or NA	
5.1	Is the laboratory reagent blank analyzed with each batch of 20 or fewer samples and is it found to be less than 2.2 times the analyte's MDL or less than 10% of the analyte level determined for a sample?	(ORDM)200.9,9.3.1 (5/94)		
5.2	Is an instrument performance check solution analyzed at the beginning, end and with every 10 samples and is it found to be within 5% of calibration at the start and within 10% of calibration during subsequent analysis?	(ORDM)200.9,9.3.4 (5/94)		
5.3	Is the calibration blank less than the instrument detection limit (IDL) but greater than a negative signal in concentration units equal to the IDL?	(ORDM)200.9,9.3.4 (5/94)		

5.4	Is a quality control sample obtained from an outside source, analyzed at least quarterly and found to be within ± 10% of the stated values?	(ORDM)200.9,9.2.3 (5/94)		
5.5	Is a calibration check standard (made from a reference material or other independent standard material at or near the mid range) analyzed at the beginning (and found to be within ± 10% of the true value) and after every 10 samples (found to be within ±20% of the true value)?	(SW846)7000A,8.2 (7/92)		
5.6	Are the method detection limits determined annually or whenever a new operator begins work. Are they determined using seven replicates at two to three times the estimated instrument detection limit?	(ORDM)200.9,9.2.4 (5/94)		
5.7	Is a laboratory fortified blank analyzed with each batch and is the recovery within ±15% of the analyte added to fortify the solution?	(ORDM)200.9,9.3.2 (5/94)		
5.8	Is a laboratory fortified matrix performed for a minimum of 10% of the routine samples and is the recovery ± 30%?	(ORDM)200.9,9.4.2 (5/94)		
5.9	Is at least 1 matrix spike and 1 matrix spike duplicate in each analytical batch?	(SW846)7000A,8.4 (7/92)		
5.10	Is at least one typical sample per analytical batch selected for serial dilution to determine if interferences are present?	(SW846)7000A,8.6 (7/92)		