LEAD in Surface Wipe Samples 9100

Pb MW: 207.19 CAS: 7439-92-1 RTECS: OF7525000

METHOD: 9100, Issue 2 **EVALUATION: NOT APPLICABLE** **Issue 1: 15 August 1994**
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PURPOSE: Determination of surface contamination by lead and its compounds.

LIMIT OF DETECTION: 2 µg Pb per sample (0.02 µg/cm^2 for 100-cm^2 area) by flame AAS [1] or ICP [2];
0.1 µg Pb per sample (0.001 µg/cm^2 for 100-cm^2 area) by graphite furnace AAS [3,4].

FIELD EQUIPMENT:
1. Resealable hard-walled sample containers, e.g., 50-mL plastic centrifuge tubes [5].
2. Wipes: Disposable towellettes moistened with a wetting agent.
   NOTE 1: Wipes selected for use should contain insignificant (<5 µg Pb) background lead levels [4,5]. Wipes should be individually wrapped and pre-moistened; for example, Wash'n Dri™ hand wipes (or equivalent).
   NOTE 2: Whatman filters should NOT be used for wipe sampling, because they are not sufficiently durable.
3. Powderless plastic gloves, disposable.
4. Template, plastic or steel; 10 cm x 10 cm or other standard size.
5. Tape Measure.
6. Masking Tape.

SAMPLING:
1. Don a clean pair of gloves.
2. Place the template over the area to be sampled, and secure the outside edges with masking tape. If the area to be sampled is in a confined area and a template cannot be used, measure the sampling area with the tape measure, and delineate the area to be sampled with masking tape.
3. Remove a wipe from its package, and unfold it.
4. Re-fold the wipe into fourths, and wipe the surface to be sampled with firm pressure. Use an overlapping "S" pattern to cover the entire surface area with horizontal strokes.
5. Fold the exposed side of the wipe in, and wipe the same area using vertical "S"-strokes.
6. Fold the wipe once more to reveal an unexposed surface, and wipe the surface a third time as described in step 4.
7. Fold the wipe, exposed side in, and place it into a clean hard-walled sample container (e.g., 50-mL centrifuge tube). Seal securely, and clearly label the sample container.
   NOTE: Compositing of wipe samples is not recommended, because (a) they cause sample preparation and analytical difficulties, and (b) site-specific analytical information is lost.
8. Clean the template in preparation for the next wipe sample.
9. Discard gloves.
10. Field blanks: 5% of samples, at least two per sample set. Remove unexposed wipes from their packaging and place into sample containers.

SAMPLE PREPARATION: Use the procedure of NIOSH Method 7105 or equivalent [3,6], including final sample

dilution to 10 mL.

NOTE: Additional portions of nitric acid may be needed for complete digestion of the wipe sample. Include appropriate media and reagent blanks.

MEASUREMENT: Depending on detection limit required, use the procedures of NIOSH methods 7082 (Lead by flame AAS) [1], 7300 (Elements by ICP) [2], or 7105 (Lead by graphite furnace AAS) [3], or equivalent methods [6,7].

REFERENCES:

[1] NIOSH [1994]. Lead by FAAS: Method 7082. In: Eller PM, Cassinelli ME, Eds., NIOSH Manual of analytical methods, 4th ed. Cincinnati, OH: U.S. Department of Health and Human Services, DHHS (NIOSH) Publication No. 94-113.

[2] *Ibid.* Elements by ICP: Method 7300.

[3] *Ibid.* Lead by GFAAS: Method 7105.

[4] Millson M, Eller PM, Ashley K [1994]. Evaluation of wipe sampling materials for lead in surface dust. Am Ind Hyg Assoc J *55*: 339-342.

[5] ASTM [1994]. Emergency standard practice for field collection of settled dust samples using wipe sampling methods for lead determination by atomic spectrometry techniques: ASTM ES 30. In: ASTM standards on lead-based paint abatement in buildings. Philadelphia, PA: American Society for Testing and Materials.

[6] *Ibid*. Emergency standard practice for hot plate digestion of dust wipe samples for determination of lead by atomic spectrometry: ASTM ES 36.

[7] *Ibid.* Standard test method for analysis of digested samples for lead by inductively coupled plasma atomic emission spectrometry (ICP-AES), flame atomic absorption (FAAS), or graphite furnace atomic absorption (GFAAS) techniques: ASTM E 1613.

METHOD WRITTEN BY:

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