

OSHA SAMPLING DATA SHEET #7a

Substance:

Vinyl chloride.

Standard: 29 CFR 1910.93q, permanent standard of October 4, 1974

1. Limits of exposure:

- | | |
|--|--------|
| a. 8 hour time weighted average (TWA) | 1 ppm |
| b. 15 minute ceiling average | 5 ppm |
| c. 15 minute ceiling for those electing
not to wear respirators | 25 ppm |

2. Action level: 8 hour TWA 0.5 ppm

Sampling Equipment:

A calibrated personal sampling pump whose flow rate at 50 ml/min is accurate within $\pm 5\%$ and activated coconut shell tubes containing two sections of 20/40 mesh activated charcoal separated by a 2-mm portion of urethane foam.

Qualifications:

Samples shall be collected only by or under the direction of Compliance Safety and Health Officers (CSHOs) who are Industrial Hygienists.

Sampling Rate:

50 ml/min for all samples

Sample Size:

1. TWA samples:

- 5 liter maximum at concentrations below 200 ppm;
maximum duration 100 min.
- 2 liter maximum at concentrations above 200 ppm;
maximum duration 40 minutes.

NOTE: In some cases it may be necessary to estimate the vinyl chloride concentration with a portable direct reading instrument to determine the proper volume of air to sample.

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2. Ceiling average samples:

750 milliliters; 15 min. duration

There should be no variation from 15 minutes unless the variation is justifiable.

Sampling Procedure:

- (1) Employee exposures are determined by collecting air samples from a worker's breathing zone using personal samplers.
- (2) TWA 8-hour average exposures are determined by collecting a series of consecutive personal air samples that completely cover the duration of exposure in the 8-hours.
- (3) Fifteen minute ceiling average exposures are determined by collecting full 15 minute period personal air samples.
- (4) Which employee exposures to measure may be determined by screening the concentration of vinyl chloride in the workplace area with a direct reading instrument.
- (5) Immediately before sampling, both ends of two charcoal tubes are broken so as to provide openings at least one-half the internal diameter of the tubes.
- (6) The first charcoal tube is positioned in the tube holder with the smaller backup section of charcoal being positioned nearest the pump. The second charcoal tube serves as a breakthrough indicator and is connected with a small, i.e 0.5 inch, piece of Tygon tubing to the outlet of the plastic charcoal tube holder with the smaller section of charcoal being positioned nearest the pump and connected to the main sample line leading to the pump. Both tubes must be in a vertical position during sampling to avoid channeling and subsequent premature breakthrough of vinyl chloride.
- (7) Air being sampled must not be passed through any hose or tubing before entering the first charcoal tube.
- (8) Set the flow rate at approximately 50 ml/min and record the initial counter number. Sample for an appropriate amount of time and record the final counter number. The sample volume is obtained by multiplying the number of counter strokes times the cc/stroke factor. Record the date, location, temperature, pressure and the tube number.

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- (9) Immediately after sample collection separate the sample tube from the backup tube and cap the tubes with the supplied plastic caps. Put a sample seal on each tube and label the tubes with matching numbers. Designate the sample tube by the letter "S" and the backup tube by the letters "BU". For example, the tubes used to collect the first sample of the day would be labeled 1-S and 1-BU.
- (10) Include one blank charcoal tube with every 20 samples (or one with each lot of samples if less than 20 samples are taken). Handle the blank in the same fashion as the others with the exception that no sample is collected on it. The ends are broken and the tube is immediately capped and prepared for shipping. Label the tube as a blank. The backup tubes are not to be considered as blanks.

Analytical Procedure:

Vinyl chloride is desorbed from activated coconut shell charcoal with carbon disulfide and analyzed using a gas chromatograph with a flame ionization detector. The primary charcoal tube is analyzed as the sample (both front and back sections together) and the backup charcoal tube is analyzed as the breakthrough indicator.

Minimum to be Reported:

0.25 ppm

NOTE: Lesser concentrations will be reported as less than 0.25 ppm, except where none is detected it will be reported as "none detected".

Special Considerations:

- (1) Do not ship bulk samples of polyvinyl chloride or copolymers of vinyl chloride to the laboratory for VC analysis. Our procedure deals with airborne VC.
- (2) Where two or more compounds are known or suspected to be present in the air, transmit this information, including their suspected identities, with the sample to the laboratory.
- (3) The sampling places a heavy load on the sampling pump due to the high resistance of two charcoal tubes in series. Therefore, do not operate the pumps more than 8 hours continuously without fully recharging the battery.

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- (4) The presence of high humidity or water mist causes a reduction in breakthrough volume. However, this has been taken into account and as long as the specified maximum sample size is not exceeded, no breakthrough should occur.
- (5) The desorption efficiency of charcoal can vary from batch to batch. Therefore, all the tubes used to collect a set of samples should contain charcoal from the same batch. Record the charcoal lot number on the sample seal.
- (6) The increased pressure drop of two tubes in series will cause the cc/stroke factor to change. Also this cc/stroke factor, at this high pressure drop, will vary slightly with flow rate. Therefore, for this special sampling situation, the pumps must be calibrated at a flow rate in the vicinity of 50 ml/min with two charcoal tubes in line ahead of the pump and a corresponding cc/stroke factor determined. When sampling for vinyl chloride use only the flow control setting that corresponds to the flow rate in the vicinity of 50 ml/min as determined from this calibration.

Shipping Instructions

Ship samples in a mailing tube. Mark it "RUSH" and send it "AIR MAIL."

The CSHO should make every effort to forward the samples to the laboratory by the morning following the day the samples are collected. It is imperative that the laboratory receive the samples soon enough to complete the analyses within 96 hours after sample collection. Pre-planning is necessary.

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