

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

SUBJECT: Alternate Vinyl Chloride Test Methods Resubmitted by DATE: December 9, 1977
Union Carbide

FROM: William Grimley, Test Support Section
Emission Measurement Branch, ESED (MD 19)

William Grimley

TO: Director, Surveillance and Analysis Division,
Regions II, III, IV, VI, IX

In accordance with requests from Regions IV, IX, and Union Carbide, we have reviewed the vinyl chloride test items which Union Carbide has resubmitted for consideration as alternate procedures. This review has been done in collaboration with the Quality Assurance Branch of the Environmental Monitoring and Support Laboratory. The items resubmitted were as follows:

1. Method 106, Section 4.3.2. Alternate chromatographic column - Stainless Steel, 6.1 m x 3.2 mm, packed with 20 percent Tergitol E-35 on 60/80 mesh Chromasorb W AW.
2. Method 107. Entire method; attached.

Based on the additional supporting information supplied by Union Carbide, both items are now judged acceptable as alternate procedures.

Because of widespread interest, the alternate Method 107 (draft copy attached) will, with some refinement, be proposed as such in the Federal Register. Acceptance of the enclosed draft should satisfy Union Carbide's needs for the present. They will be expected to follow the method as it is finally promulgated, of course.

For your information, we also expect to propose changes in both Methods 106 and 107 so that it will be possible for the method user to perform a self appraisal to determine acceptance of a particular column as an alternate procedure. This change should greatly reduce the number of requests for alternate procedure approvals.

Should you have any questions, please contact me. My FTS phone is 629-5276; commercial phone is 919 541 5276.

Enclosure

cc: Robert Ajax (MD 13)
Richard Biondi (EN 341)
Alvin Chun, Region IX
John Clements (MD 77)
Joe Knoll (MD 77)
James Wu, Region IV
Susan Wyatt (MD 13)

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2. Range and Sensitivity

The lower limit of detection of vinyl chloride in dry PVC resin is 0.2 ppm. For resin solutions, latexes and wet resin this limit rises inversely as the nonvolatile (resin) content decreases.

With proper calibration the upper limit may be extended as needed.

3. Precision and Reproducibility

A comparison of precision and reproducibility between the alternative method and Method 107 using a suspension resin homopolymer sample showed the alternative method had a standard deviation of 0.95 percent at the 340 ppm level and yielded mean results ten percent higher than Method 107. Method 107 in the same test had a standard deviation of 1.89 percent.

A standard sample of latex containing 181.8 ppm vinyl chloride analyzed ten times by the alternative method showed a standard deviation of 7.5 percent and a mean error of 0.21 percent.

A sample of vinyl chloride copolymer resin solution was analyzed ten times by the alternative method and showed a standard deviation of 6.6 percent at a level of 35 ppm.

The increase in standard deviation on the latex and the resin solution samples is due to the correction of the analysis from a gross basis to a contained dry solids basis. Both the latex and resin solution samples contained acetaldehyde along with other monomers and solvents.