UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 20 1990

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: PP#9F3743. Clethodim (Select® Herbicide)
Pre-Trial Review of Analytical Method RM-26B-1.
DEB#: None HED#: N/A MRID#: 413899-01

FROM: Maxie Jo Nelson, Ph.D., Chemist
Tolerance Petition Section I
Dietary Exposure Branch
Health Effects Division (H7509C)

THRU: Richard D. Schmitt, Ph.D., Chief
Dietary Exposure Branch
Health Effects Division (H7509C)

TO: J. Miller/M. Erumsele, PM Team 23
Fungicide-Herbicide Branch
Registration Division (H7505C)

BACKGROUND

Clethodim (Select®) is a new herbicide, and this petition represents the first food use request for the chemical.

By memo dated 4/16/90, DEB (M. Nelson) requested ACB/BEAD conduct a petition method validation (PMV) trial of Valent/Chevron Analytical Method RM-26B-1: "The Determination of Clethodim Residues in Crops, Chicken and Beef Tissues, Milk, and Eggs".

ACB/BEAD (E. Greer) has responded by memo dated 6/14/90 that their pre-trial review of this method indicates difficulties (enumerated in their memo) would be encountered by an analyst if this PMV trial were to be attempted on the method in its present form. ACB/BEAD suggests Method RM-26B-1 be rewritten so as to address the deficiencies noted in their memo.

DISCUSSION

A copy of ACB/BEAD's memo of 6/14/90 is attached to this review. The PM should send a copy of it in its entirety to the petitioner with the request that Analytical Method RM-26B-1 be revised to appropriately address the concerns raised by ACB/BEAD.

Pending receipt, review, and acceptance for trial of a suitably revised Analytical Method RM-26B-1, the PMV trial will be held in abeyance.

ATTACHMENT: ACB/BEAD memo of 6/14/90 re PP#9F3743: Pre-trial Review of Analytical Method RM-26B-1.

cc (with Attachment): M. Nelson, Reading File, PP#9F3743, ACB/BEAD (D. Marlow), PIB/FOD (C. Furlow).

cc (**without** Attachment): Circulation (7), Clethodim Registration Standard File, Clethodim Subject File.

H7509C:DEB:Reviewer(MJN):CM#2:Rm810:557-7423:typist(mjn):
CLET3743.AM3:6/19/90.

RDI:SecHd:RSQuick(byMJN):6/19/90:BrSrScientist:RALoranger:6/19/90

ATTACHMENT 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, DC 20460

Analytical Chemistry Section
Building 306, BARC-East
Beltsville, Maryland 20705

OFFICE OF
PESTICIDES AND
TOXIC SUBSTANCES

JUN 14 1990

MEMORANDUM

SUBJECT: PP9F3743: Pre-Trial Review of "The Determination of Clethodim Residues in Crops, Chicken, and Beef Tissues, Milk, and Eggs" (Chevron Chemical Company Method RM-26B-1)

FROM: Everett S. Greer, Team Leader
Analytical Chemistry Section

THRU: Charles J. Stafford
Acting Section Head
Analytical Chemistry Section

THRU: Donald A. Marlow, Chief
Analytical Chemistry Branch

TO: Maxie Jo Nelson, Ph.D., Chemist
Tolerance Petition Section I
Dietary Exposure Branch
Health Effects Division (H7509C)

During review of the subject method, numerous deficiencies and omissions were noted. Also, many of the procedures are either unclear, or the analyst is not given enough information to proceed to the following step. Problems will be addressed below on a section-by-section basis.

Reagents

The type of paper and apparatus used for filtering the barium hydroxide solution is not stated.

Sampling

After preparing oil, tissue, milk, and egg samples, the analyst is directed to proceed to the Precipitation Cleanup step, but after weighing feed and soapstock samples, the analyst is not told where to go next. Can it be assumed that

this would be the extraction step? The method states that feed or soapstock is to be weighed "into container", but the type and size of this container is omitted. The analyst would not know that this is a blender cup before proceeding to the extraction step.

For checking recoveries during the analysis of oil samples, the fortification step should preceed the addition of 50 ml of hexane rather than after as is indicated in the method. After partitioning the oil and hexane mixtures, it is stated that with some oil types, the phases are reversed, but the analyst is not given any directions for determining which phase is which. For oil samples, extracts are partitioned into a 1-liter round bottom flask before evaporation to dryness on a rotovap. The type of 1-liter flask used for rotovaping the tissue, milk, and egg extracts is not given.

Extraction

No specific directions are given for evaporating the 400 ml of water/methanol solution to "about 180 ml" except a statement saying that this is to be done on a 30 degree water bath.

Precipitation Cleanup

In the sampling step for oils, the extracts are rotary evaporated in a round bottom flask, but in this step the samples are in a "flat-bottom vessel" (size not given). Nowhere is it stated to transfer these extracts to such a "vessel".

Partition

The size of the separatory funnel is not given. Except for using a 50 degree water bath, no specific instructions are given for evaporating the dichloromethane solution to dryness.

Oxidation

It is not clear how the hydrogen peroxide is added to the reflux solution. Nowhere is it stated that it is to be added from the separatory funnel shown in Fig. 1.

Excess Hydrogen Peroxide Removal

No specific directions are given for evaporating the 100 ml aqueous solution to dryness on a 70 degree water bath.

Methylation

Directions are not clear as to how the methylene chloride solution is evaporated to dryness on a 50 degree water bath. No reference is made to the type of evaporator to be used. In this section it is stated that "if additional cleanup is not required, proceed to Measurement". No criteria are given as to when this additional cleanup is required. Two optional cleanup steps using different absorbents follow the methylation, but it is not stated if both of these steps must always be used if it has been determined that an additional cleanup is necessary.

Silica Gel Column Cleanup

It is stated that the sample is evaporated to dryness, but it has already been taken to dryness in the proceeding methylation step. The size of the round bottom flask used for collecting the eluate is not given.

C_{18} Cartridge Cleanup

No directions are given for evaporating the eluate from the proceeding step to dryness. It is not stated whether vacuum or pressure is used to elute the cleanup cartridge, and the size of the vial used for collecting the 30% methanol eluates is not given. After collecting the eluates, the analyst is not told how to extract them with the 10 ml portions of ethyl acetate.

Measurement

The type of apparatus used, other than a 50 degree water bath, for evaporating the above eluates to dryness is not given. After this first evaporation, the extracts are transferred to a small round bottom flask (size not given) and again evaporated to dryness, but no specific directions are given.

It is stated that "if the sample causes major sensitivity loss, the sample may be dissolved in hexane." No criteria are given as to what constitutes a major sensitivity loss, nor is the analyst told what to do with this acetone sample solution if sensitvity losses are determined to exist. Is it simply discarded and the complete analysis repeated, or is the solution evaporated to dryness and the residue redissolved in hexane?

Concentration Determination

The formula for calculating ug/ul should be

$$\left(\frac{\text{area}}{A}\right)^{1/B}$$

instead of $\frac{(\text{area})^{1/B}}{(A)}$

CONCLUSION

Because of the difficulties that would be encountered by an analyst if this Petition Method Validation were to be attempted in its present form, we suggest that the method be rewritten so as to address the deficiencies stated above.