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

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OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: EPA No. 239-1683: Diquat Dibromide. Additional Data for Amended Registration for Aquatic Use on Hydrilla. MRID No. 400082-01; RCB No. 1725

FROM: J. Garbus, Chemist
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THRU: Andrew Rathman, Section Head
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TO: R. Mountfort, PM-23
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Chevron Chemical Company, Ortho Chemicals Division, Richmond, CA has submitted additional data to support its request for an amended registration of Ortho Diquat Water Weed Killer for use to control hydrilla.

RCB's original review of the requested amended registration (L. Cheng, 12/2/85) noted deficiencies in the request and recommended against the registration of this use. We shall repeat the conclusions of the original RCB review, give the registrant's response, and present our further comments.

° There is no specified maximum number of applications of diquat in a fixed period of time. Chevron needs to supply this restriction

Registrant's Response

In its proposed label changes, dated 10/16/86, Chevron has added the restriction: "Do not make more than 6 applications per year."

Comment

Limiting the number of application to water to no more than 6 per year meets the RCB request for such a limitation. We note that no interval is proposed between applications. The Diquat Water Weed Killer label carries a restriction that diquat treated water should not be used for agricultural or domestic purposes for 14 days after treat-

ment. We suggest that a similar interval be imposed before retreatment. We also note that multiple treatments of water with diquat raise the possibility of cummulative residues. Chevron's residue data, submitted to support this amended registration, was derived from samples taken 10 to 14 days after a single, surface application.

° We cannot verify the adequacy of the submitted residue data since the water samples, by and large, were kept at room or ambient temperatures for as long as almost 3 months prior to analysis. Chevron needs to demonstrate the stability of diquat in water under these conditions.

Registrant's Response

Chevron has submitted a study titled: "Stability of Diquat Cation in Water Stored at Ambient Temperature.". The results show that storage for 91 days in plastic containers kept dark of acidified (1.4 N), deionized water containing 10 ppb diquat cation results in the loss of about 50% of the initial material. The analytical method (see below) has a limit of detection of 4 ppb. The residue data submitted in Sept. 1985 to support the amended registration reported diquat levels of 0.000 ppm in the stored samples of treated water. Assuming actual levels between 0 and 4 parts per billion and assuming 50% loss of diquat, the initial levels in the samples would be less than the 10 ppb that is the Allowable Residue Level in Drinking Water (ARLDW).

Comment

The data show that diquat is not stable in water. After 3 months of storage, under conditions designed to promote stability, 50% of the initial material was not recovrable as diquat. Chevron has used this data to justify its assumption that diquat levels in treated water is below the ARLDW at 10 to 14 days. However, the results also indicate the need to correct analytical results from stored samples for the decline in residue levels. Furthermore, Chevron has not identified the products that results from this decomposition of diquat.

° Residue data supporting the use of diquat with a polymer carrier need to be furnished.

Registrant's Response

The registrant has not provided any additional residue data related to uses of diquat with a water carrier polymer or an invert emulsion polymer.

Comment

In light of the revised label provision for multiple applications, residue data are needed from applications that involve polymers that may retard the dissolution of diquat in water.

" Directions for the analysis of water samples are not provided in Method RM-5. These, along with any modifications made prior to 1982 should be provided.

Registrant's Response

Chevron has submitted copies of method RM-5, its original method for the analysis of diquat in plant material, soil, and water; RM5-5, the latest revision of that method; RM-5W-1; the method as specifically applied to water; and RM-5W-3, the latest revision of the water method, dated April, 1985. The methods are essentially similar, except that methods for water omit a sulfuric acid digestion. After cleanup by ion exchange, the absorbance of the eluted diquat cation is determined at 3 adjacent wavelenghts. This procedure allows for the correction of the absorbancies for any absorbance due to background from coeluting material. The revision of the water method involves the use of a diode array spectrophotometer coupled to a program designed to do the calculations for background correction. A copy of the program and a sample printout are given.

Comment

The complete description of the procedure for the analysis of diquat in water satisfies the request.

Conclusions

1. Chevron has added a restriction limiting the number of applications of Diquat Water Weed Killer to 6 per year.

2. Chevron has submitted the results of stability studies that indicate that 50% of diquat is lost in water samples after 90 days of storage.

Note: Polymer carriers have been dropped; only inverts remain. Original data ok's on inverts CK

3. Residue data from the use of water carrier and invert emulsion polymers in treating water with diquat has not been provided.

4. An adequate description of the analytical method for diquat in water samples has been provided.

5. Residue data are needed reflecting the maximum number of applications (i.e., 6) under conditions using polymers that may retard the dissolution of diquat in water.

6. Analytical results from such studies must reflect the instability of diquat in stored water samples.

Recommendation

We continue to recommend against the proposed registration because of Conclusions 5 and 6. Also the registrant should be informed that a retreatment interval must be added to the label. We suggest a 14 day interval; however, data to support any interval chosen must be supplied.

cc: R.F., Amended U.F., Circ., Reviewer, PMSD/ISB
RDI:ARR:1/29/87:RDS:1/29/87
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