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Shaughnessy #: 059101

Due Date: 01/26/85

Init: Q

To: J. Ellenberger
Product Manager #12
Registration Division (TS-767C)

From: Joseph C. Reinert, Ph.D., Chief
Special Review Section
Exposure Assessment Branch
Hazard Evaluation Division (TS-769C)

JCR

Attached please find the EAB review of...

Reg./File No.: 49244-1 and 49244-2

Chemical: Chlorpyrifos

Type Product: Insecticide

Product Name: Super IQ

Company Name: Biochemico Dynamic Americas, Corp

Submission Purpose: Exposure Data

ZBB Code:

ACTION CODE: 450

Date In: 12/13/84

EAB # 5198 and 5199

Date Completed: 1/22/85

TAIS (level II)

Days

63

4

Deferrals To:

Ecological Effects Branch

Residue Chemistry Branch

Toxicology Branch

1.0 INTRODUCTION

Biochemico Dynamic Americas Corporation has submitted an exposure assessment study in support of their request to amend the registration of Super IQ Insecticide Coating LC and Super IQ Insecticide Coating APT to include interior use.

2.0 METHODS

The airborne concentration of chlorpyrifos, the active ingredient in the Super IQ Insecticide Coatings, was measured during the study. Both Super IQ pesticides contain 0.90% chlorpyrifos. The pesticides are liquids contained in one gallon containers and are painted on to walls and ceilings by brush, roller, or spray. The label recommends that the pesticide be applied without dilution and that two coats be used. Each gallon covers 450 to 500 ft².

A total area of 478 ft², representing 63% of the interior surface of a bedroom, was painted. Approximately 113 ft² of the surface was painted with Super IQ APT. A professional painter applied the coatings using a brush and a roller.

Respiratory exposure was measured for one painter. Dermal exposure was not measured. Two samples were taken by placing a glass collection tube containing XAD-2 resin in the breathing zone of the painter. A pump attached to the painter's belt drew air through the collection tube at a rate of 200 cc/min for 120 minutes during each of the two collection periods. Respiratory samples were collected when the painter had completed 50% and 100% of the painting.

Ambient air concentrations of chlorpyrifos were measured one day prior to painting, when 50% of the painting was completed, upon completion of the painting, at 6, 12, and 24 hours after painting, and 3, 7, 14, 21, 30, 60, and 90 days after completion of painting. The air samples were collected for 120 minute intervals by drawing 200 cc/min through a glass collection tube containing XAD-2 resin placed in the center of the room. Windows and doors were left open to provide ventilation. Chlorpyrifos trapped in the XAD-2 resin was extracted in pesticide grade hexane and measured by gas chromatography using USEPA Method 8140. Prior to painting and on the day of painting duplicate air samples were taken and spiked with 31.80 ug of chlorpyrifos. The percentage of recovery ranged from 91 to 93%.

3.0 RESULTS

Ambient air concentrations of chlorpyrifos were at either trace or non-detectable levels for all samples except 60 days after painting at which time the air concentration was 3 ug/m³. Non-detectable concentrations ranged from <7 to <10 ug/m³ and trace levels from <7 to <3 ug/m³. The report did not explain the reasons for variations in detection limits or why trace levels were at concentrations below non-detectable levels.

4.0 DISCUSSION

The basic methodology to measure respiratory exposure and ambient air concentrations of chlorpyrifos was adequate; however, the study as a whole was inadequate for an exposure assessment study.

Applicator dermal exposure was not measured even though this route of exposure would be expected to be a more significant route of exposure to an applicator than the respiratory route. In addition to the failure to measure dermal exposure, only one replicate was used. EAB can not accept an exposure assessment based on one replicate as it is impossible to determine if the estimated exposure is a representative or an aberrant value.

The determination of ambient chlorpyrifos levels from the paint residues was conducted over a 90 day period which is an adequate period of time. The report also stated that windows and doors were left open to provide general dilution ventilation. This practice would be consistent with label requirements to provide adequate ventilation during application. It was not clear from the report whether the windows and doors were left open during the entire 90 day period. Such a practice would be unrealistic since the majority of homes do not leave windows open over a 90 day period.

The registrant states in the cover letter accompanying the data submission (Garrow, GL. 26 November 1984) that the study was conducted in accordance with a protocol set by the Agency. A protocol was submitted by Biochemico Dynamic Americas Corporation on 11 November 1983 and reviewed by James Adams (17 January 1984). That review stated that exposure to the painters could be expected to be the highest. The review advised the registrant that a determination of applicator (dermal and respiratory) exposure could be avoided by the label requiring protective clothing use. Neither the Super IQ Insecticide Coating APT or Super IQ Insecticide Coating LC labels contain requirements for protective clothing as suggested by Dr. Adams to avoid measuring applicator exposure. During the year that has elapsed since the review of protocols by EAB, research on the degree of protection afforded by protective clothing has indicated that practical forms of protective clothing do not provide complete protection. Therefore the current opinion of EAB is that dermal exposure to the applicator must be measured and as with the the ambient air concentration data, must be measured on an adequate number of replicates to allow meaningful interpretation of the data.

5.0 CONCLUSION

This study is inadequate for an exposure assessment. Additional replicates and dermal exposure measurements for the applicators are required.

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