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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Tetramethrin - Composition of Technical Tetramethrin
Used in Toxicology Studies

Caswell No.: 844

FROM: William Dysktra, Reviewer *William Dysktra*
Review Section I *7/31/89*
Toxicology Branch I - Insecticide, Rodenticide Support
Health Effects Division (H7509C)

1. Study - Two-Year Dietary Administration in the Rat;
Hazleton Labs #343-107; October 4, 1974; EPA Accession
No. 247280

Test Material - The substance tested was Neopynamin -
described as a coarse white powder or coarse white
granular material, unpleasant odor. The precise
purity or lot numbers of the test material were not
given. For the purposes of determining the dosage
levels, 100 percent purity was assumed by the testing
laboratory.

2. Study - Chronic Toxicity Study in Rats; Hazleton Labs
#343-117; June 11, 1981; EPA Accession No. 247280.
Test Material - Neopynamin was from lot 72875 (90.0%
purity) and lot 90112 (93.6% purity). Dosages were
adjusted to 100 percent purity for preparation of
the test diets.

3. Study - 13-Week Dose Range-Finding Study in Mice;
Hazleton Labs #345-135; August 27, 1981.

Test Material - Neopynamin; lot number not stated but
the purity was stated as being 93.3 percent.

4. Study - Fertility Study in Rats; Hamamatsu Seigiken
Research, Japan, IT-01-0075; June 14, 1980; EPA
Accession No. 248342, Table 1.

Test Material - Neopynamin; lot number 90508; percent purity not stated; supplied by Sumitomo Chemical Company.

5. Study - Reproduction Test of Neopynamin Part 4. Perinatal and Postnatal Study in Rats; Hamamatsu Seigiken Research, Japan, IT-01-0075; June 14, 1980; EPA Accession No. 248342; Table 4.

Test Material - Neopynamin; Lot No. 90508; purity not stated; supplied by Sumitomo Chemical Company.

6. Study - Reproduction Test of Neopynamin Part 2: Teratology Study in Rats; Hamamatsu Seigiken Research, Japan; IT-01-0076; June 14, 1980; EPA Accession No. 24842; Table 2.

Test Material - Neopynamin; Lot No. 90508; purity not stated.

7. Study - Reproduction Test of Neopynamin Part 3: Teratology Study in Rabbits; Hamamatsu Seigiken Research, Japan; IT-01-0077; June 14, 1980; EPA Accession No. 248342; Table 3.

Test Material - Neopynamin; Lot No. 90508; purity not stated.

8. Study - Combined Chronic Toxicity and Oncogenicity Study in Mice; Hazleton Labs #343-136; April 17, 1986 and May 29, 1987; EPA Accession Nos. 262778-262788 and 402763-01.

Test Material - Neopynamin; ligh yellow chunks; Batch No. 008-11; purity 93.3%.

9. Study - Subchronic Toxicity in Dogs; Hazleton Labs #343-127; June 17, 1981; EPA Accession No. 247280.

Test Material - Neopynamin Technical; Lot No. 00208; 94.6% purity.

Analysis of Test Material

As can be seen from this memorandum and the attached reviews, the test material used in the 1974 chronic rat study was described as a coarse white powder or coarse white granular material with an unpleasant odor. The precise purity and lot numbers were not given. This test material differs slightly in description from the material used in the 1986 chronic toxicity/oncogenicity study in mice. In this study, neopynamin

is described as light yellow chunks. It appears that neopynamin technical was used in both studies and all relevant subsequent studies, (1981 chronic rat study in Sprague-Dawley and Long-Evans Rats, Dog Study, Teratology and Reproduction Studies, and Mutagenicity Studies).

The following information taken from the Environmental Health criteria of the IPCS (August, 1988 - Second Draft) describes the identity, physical and chemical properties of tetramethrin:

"Tetramethrin was invented in 1964 and marketed in 1965. Chemically, it is an ester of chrysanthemic acid (CA), 2,2-dimethyl-3-(2,2-dimethylvinyl)-cyclopropanecarboxylic acid, with 3,4,5,6-tetrahydrophthalimidomethyl alcohol (MTI) and a mixture of four stereoisomers: [1R,trans], [1R,cis], [1S,trans], and [1S,cis]. In technical products, the composition ratio of the isomers is roughly 4:1:4:1. Among the isomers, the [1R,trans]-isomer is the most active biologically followed by the [1R,cis]-isomer. A mixture of the [1R,cis]- and [1R,trans]-isomers (1:4) is commercialized under the trade name of Neopynamin Forte®.

"Technical grade tetramethrin is a colourless solid having melting point of 65-80 °C. The specific gravity is 1.11 at 20 °C. The vapour pressure is 7.1×10^{-6} mm Hg at 30 °C. It is sparingly soluble in water (4.6 mg/litre at 30 °C), but soluble in organic solvents such as hexane, methanol, and xylene. It is stable to heat, but unstable to light and air. [1R,cis,trans]-Isomer of tetramethrin is a yellow viscous liquid, but has physical and chemical properties similar to tetramethrin." [End of quotation.]

Attachments