4-19-89

DATA EVALUATION RECORD

DPX-L5300 STUDY 2

SHAUGHNESSY No. 128887
COMMON NAME: DPX-L5300
CHEMICAL NAME: Methyl 2-[[[N-(4-methoxy-6-methyl-1,3,5-triazin-2-yl) methhylamino] carbonyl] amino] sulfonyl] benzoate
FORMULATION: Active Ingredient
DATA REQUIREMENT: Photodegradation in Water (161-2)

FICHE/MASTER ID 40245520
Ferguson, E.M. 1986. Photodegradation of [triazine-2-^{14}C]DPX-L5300 and [phenyl(U)^{14}C]DPX-L5300 in aqueous systems. Laboratory Project ID AMR-534-86. Prepared and submitted by E.I. du Pont de Nemours and Company, Inc., Wilmington, DE. No. 7F3540.

SUBST. CLASS = S

DIRECT RVW TIME = 8

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CONCLUSIONS:

Degradation - Photodegradation in Water

(1) The study is acceptable and satisfies the photodegradation in water (161-2) data requirement for registering pesticides by providing information on the photodegradation of triazine- and phenyl-labeled [^{14}C]DPX-L5300 in water.

(2) Neither DPX-L5300 at an initial concentration of 10 ppm in a sterile pH 9 aqueous buffer, nor its hydrolytic degradates underwent any conclusive photodegradation at 25°C during 30 days exposure to sunlight.

SUMMARY OF DATA BY REVIEWER:

Triazine- and phenyl-labeled [^{14}C]DPX-L5300 (radiochemical purities 97%, specific activities 41.2 uCi/mg and 20.5 uCi/mg, respectively), at 10 ppm, were resistant to photolytic degradation in a sterile pH 9 aqueous buffered solution irradiated with natural sunlight for 716 hours (196,189 Watt-hours/m^2) at 25°C. In the irradiated solutions, DPX-L5300 declined from 91.6-93.5% of the applied immediately posttreatment to 79.3-83.8% of the applied at 716 hours (30 days) posttreatment. In the dark controls, DPX-L5300 concentrations declined to 82.9-84.5% of the applied at 716 hours posttreatment. The major degradation route in both irradiated and dark control solutions was hydrolytic cleavage of the sulfonylurea bridge to form triazine amine and sulfonamide. Triazine amine was then demethylated to either N-demethyl or O-demethyl triazine amine, while sulfonamide further decomposed to acid sulfonamide and/or saccharin. At 716 hours posttreatment, triazine amine accounted for a maximum of 6.5% of the recovered; N-demethyl triazine amine and O-demethyl triazine amine accounted for 3.8% and 1.1%, respectively.

A maximum of 2.8% of sulfonamide was recovered after 500 hours in the dark control, and acid sulfonamide plus saccharin (together maximum 3.5%) was recovered at 716 hours of irradiation. No degradates were unique to the dark control or irradiated samples. No volatilization was detected (<0.05% of total radioactivity at each sampling interval). The material balance at each sampling interval ranged from 97 to 109% of the applied. Triazine-labeled [^{14}C]DPX-L5300, at 10 ppm, degraded in sunlight-irradiated and nonirradiated sterile aqueous buffered solutions of pH 7 with calculated half-lives of 311 and 381 hours, respectively, and in irradiated and nonirradiated solutions of pH 5 with a half-life of <20 hours (from 88.2 to <5% of the recovered). At pH 9, the calculated half-lives are greater than 200 days.

DISCUSSION:

(1) Acid sulfonamide and saccharin were not resolved well using HPLC (R_t 14.5-15.0), and were reported as a sum rather than individually.

(2) DPX-L5300 is most stable to hydrolysis at pH 9; therefore, photodegradation of the phenyl-labeled [^{14}C]DPX-L5300 was studied only at pH 9.