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

EPA United States Environmental Protection Agency Office of Pesticide Programs

MEMORANDUM

7/21/2021

SUBJECT: Acute Toxicity Review for *Surface Wise 2*, EPA Reg. No.: 92082-E

FROM: Joseph Williams Jr., PhD
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THRU: Jenny Tao, Senior Scientist (Acute Toxicology) 07/21/2021
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TO: Aline Heffernan Acting PM Team 31/John Hall
Regulatory Management Branch I
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Registrant: Allied Bioscience Inc.		
Decision No.: -	Submission No.: 1064820	E-Sub No.: 60461
Case No.: 00295106	Action Code: A540	
MRID No(s).: - 51475504, -05, -06, -07, -08, -09		

Formulation from label			
PC code(s)	CAS #(s)	Active Ingredient(s)	% weight
107403	199111-50-7	1-Octadecanaminium, N,N-dimethyl-N-[3-(trihydroxysilyl)proply],chloride	0.75%
		Other Ingredients	99.25%
		Total	100%

I. BACKGROUND

The Registrant, Allied Bioscience Inc., has submitted an application for pesticide registration for their product: *Surface Wise 2*, EPA Reg. No. 92082-E. The product is a non-integrated, end-use product. The registrant has submitted six acute toxicity studies in support of the proposed registration. The product is an antibacterial surface coating intended to be used as a sanitizer on hard non-porous surfaces.

II. FINDINGS/RECOMMENDATIONS

The acute toxicity profile of *Surface Wise 2*, EPA Reg. No. 92082-E, is currently:

Study	MRID	Toxicity Category	Status
Acute Oral Toxicity	51475504	IV	Acceptable
Acute Dermal Toxicity	51475505	IV	Acceptable
Acute Inhalation Toxicity	51475506	IV	Acceptable
Primary Eye Irritation	51475507	IV	Acceptable
Primary Skin Irritation	51475508	IV	Acceptable
Dermal Sensitization	51475509	Nonsensitizer	Acceptable

Conclusion: The acute toxicity data requirements have been satisfied to support the registration of EPA Reg. No. 92082-E.

III. PRODUCT LABELING

1. Based on the above acute toxicity profile (Category IV) for *Surface Wise 2*, EPA Reg. No. 92082-E, the presence of the signal word is optional. If one is used, it must be "CAUTION".
2. The front-panel statement "Keep Out of Reach of Children" (KOROC) is required. The Agency Product Manager (PM) may, in accordance with 40 CFR §156.66, decide whether to waive the KOROC requirement, and whether to approve its placement on other than the front panel, according to the Agency's Label Review Manual (https://www.epa.gov/pesticide-registration/label-review-manual).
3. No specific First Aid or human-hazard precautionary statements (or headings) are required either. The registrant may also choose to use Toxicity Category III for labeling (Precautionary & First Aid statements), as the acute toxicity profile indicates that the proposed product is Toxicity Category IV, based on the Agency's Label Review Manual (https://www.epa.gov/pesticide-registration/label-review-manual).

DATA REVIEW FOR ACUTE ORAL TOXICITY TESTING (OCSPP 870.1100)

Product Manager: PM 31 **Reviewer:** J. Williams Jr.
MRID No.: 51475504 **Study Completion Date:** 5/4/2020
Study No.: 23464-20

Testing Laboratory: STILLMEADOW, Inc.
Author: Vincent A. Murphy, Ph.D., DABT

Quality Assurance (40 CFR §160): Included

Test Material: SurfaceWise 2
Dose levels: 5583 mg/kg bw

Animals: Rat, Sprague-Dawley
Number/Sex: 3 Females
Age: 10-12 weeks
Weight: 178-229 grams
Source: Texas Animal Specialties, Humble, TX

Method: OCSPP 870.1100; OECD 425

Summary:

1. **Estimated LD_{50}:** >5583 mg/kg bw
2. **Toxicity Category:** IV
3. **Classification:** Acceptable

Deviations from protocol: Relative humidity (42-95%) was at times outside of the recommended range of 30-70%. Actual dose was 5583 mg/kg bw due to calculation using incorrect density (used 0.8956 g/mL instead of 1.005 g/mL).

Results:

The test material (a clear colorless solution) was administered as received via gavage to three fasted animals as provided in Table 1. Each rat was observed for clinical signs at least three times on Day 0 and then once daily for 14 days. Rats were administered 5583 mg/kg bw. All animals survived test substance administration, gained body weight, and appeared normal for the duration of the study. No gross findings were observed in any animal.

Table 1. Reported Mortality			
Dosing Sequence	**Dose Level (mg/kg bw)**	**Short-Term Outcome**	**Long-Term Outcome**
Limit Test			
1	5583	O	O
2	5583	O	O
2	5583	O	O

O = Survival

DATA REVIEW FOR ACUTE DERMAL TOXICITY TESTING (OCSPP 870.1200)

Product Manager: PM 31 **Reviewer:** J. Williams Jr.
MRID No.: 51475505 **Study Completion Date:** 5/4/2020
Study No.: 23465-20

Testing Laboratory: STILLMEADOW, Inc.
Author: Vincent A. Murphy, Ph.D., DABT

Quality Assurance (40 CFR §160): Included

Test Material: SurfaceWise 2
Dose levels: 5639 mg/kg bw

Animals: Rat, Sprague-Dawley
Number/Sex: 5 Males and 5 Females
Age: 8-12 weeks
Weight: Males: 242-276 g; Females: 209-237 g
Source: Texas Animal Specialties, Humble, TX

Summary:

1. **Estimated LD_{50}:** >5639 mg/kg bw
2. **Toxicity Category:** IV
3. **Classification:** Acceptable

Deviations from Guideline 870.1200: Relative humidity (43-95%) was at times outside of the recommended range of 30-70%. Actual dose was 5639 mg/kg bw due to calculation using incorrect density (used 0.8956 g/mL instead of 1.005 g/mL).

Results:

The test substance (a clear colorless solution) was applied as received for a 24-hour dermal exposure to previously clipped skin (about 10% of the total body surface area) (Table 1). All animals survived test substance administration, gained body weight (one after transient loss), and appeared normal during the study. There were no signs of gross toxicity, dermal irritation, adverse clinical effects, or abnormal behavior. No gross abnormalities were noted for any of the animals when necropsied at the conclusion of the 14-day observation period. Under the conditions of this study, the single dose acute dermal LD_{50} of the test substance is >5639 mg/kg bw in male and female rats.

Table 1. Mortality

Nominal dose (mg/kg bw)	Number Dead / Number Tested		
	Males	Females	Combined
5639	0 / 5	0 / 5	0 / 10

DATA REVIEW FOR ACUTE INHALATION TOXICITY TESTING (OCSPP 870.1300)

Product Manager: PM 31 **Reviewer:** J. Williams Jr.
MRID No.: 51475506 **Study Completion Date:** 4/29/2020
Study No.: 23466-20

Testing Laboratory: STILLMEADOW, Inc.
Author: Andrew Doig, M.S.

Quality Assurance (40 CFR §160): Included

Test Material: SurfaceWise 2
Concentrations: Chamber (gravimetrically determined): 5.04 mg/L
Nominal: 24.2 mg/L
Chamber Type: Nose-only

Animals: Rat, Sprague-Dawley
Sex: 5 Males and 5 Females
Age: 8-10 weeks
Weight: Males: 254-268 g; Females: 184-214 g
Source: Texas Animal Specialties, Humble, TX

Method: OCSPP 870.1300; OECD 403

Summary:

1. **LC_{50}:** >5.04 mg/L (both sexes)
2. **Mean MMAD:** 3.0 µm (GSD = 2.3)
3. **Toxicity Category:** IV
4. **Classification:** Acceptable

Deviations from Guideline 870.1300 and other comments: Housing relative humidity (39-91%) and exposure chamber relative humidity (99%) were at times outside of the recommended range of 30-70%. Chamber concentration was measured gravimetrically without doing pre-study analytical work to verify that the atmosphere in the animals' breathing zone was analogous to the formulation.

Results:

The table below gives the mortality following a four-hour nose-only inhalation exposure to a gravimetric concentration of 5.04 mg/L of the test substance aerosolized as received. All animals survived exposure, appeared normal, and gained body weight (most following transient loss) during the study. Mottled lungs or dark spots on the lungs were observed in four males and three females at necropsy. No other gross abnormalities were noted in any animal.

Reported Mortality

Exposure Concentration (mg/L)	Number dead / Number tested		
	Males	**Females**	**Combined**
5.04	0 / 5	0 / 5	0 / 10

Chamber Atmosphere

Mean (±SD) Exposure Conc. (mg/L)	Mean MMAD (µm)	Mean GSD	% of Particles < 3.7 µm
5.04 (Range: 4.961–5.251)	3.0 (3.3, 3.1, 2.5)	2.3 (2.1, 2.2, 2.5)	51.15-62.25

Chamber Environment

Exposure Level (mg/L)	5.04
Chamber Volume (L)	500
Total Airflow Rate (Lpm)	218
Temperature (°C)	21.0-21.7
Relative Humidity (%)	99

DATA REVIEW FOR ACUTE EYE IRRITATION TESTING (OCSPP 870.2400)

Product Manager: PM 31 **Reviewer:** J. Williams Jr.
MRID No.: 51475507 **Study Completion Date:** 5/4/2020
Study No.: 23467-20

Testing Laboratory: STILLMEADOW, Inc.
Author: Vincent A. Murphy, Ph.D., DABT

Quality Assurance (40 CFR §160): Included

Test Material: SurfaceWise 2
Dosage: 0.1 mL

Animals: Rabbit, New Zealand albino strain

Sex: 1 Male, 2 Female
Age: ~16 weeks
Weight: Males and Females: 3.0-3.1 kg
Source: Robinson Services, Inc., Mocksville, NC

Summary:

1. **Toxicity Category**: IV
2. **Classification**: Acceptable

Deviations from Guideline 870.2400 and other comments: Relative humidity (49-82%) was at times outside of the recommended range of 30-70%.

Results:

The tables below provide the results ("positive" irritation and mean total irritation scores) following instillation of 0.1 mL of the test material as received into the right eye of three rabbits. Prior to instillation, both the treated and control eyes of each animal were topically anesthetized with Tetracaine Hydrochloride Ophthalmic Solution and systemic analgesic was provided. No clinical effects were noted, and beginning and ending body weight ranges indicated that all animals maintained body weight during the study. One hour after test substance instillation, all treated eyes exhibited non-positive conjunctival redness (grade 1). All conjunctival irritation resolved by 24 hours. No corneal opacity or iritis was observed in any treated eye during the study. The Maximum Mean Total Score was 2.0 at 1 hour. Under the conditions of this study, the test substance was classified as practically non-irritating to the eye.

Incidence of Irritation

Time Post-Instillation	No. of Animals Testing "Positive" / No. of Animals Tested			
	Corneal Opacity	Iritis	Conjunctiva [a]	
			Redness	Chemosis
1 hour	0 / 3	0 / 3	0 / 3	0 / 3
24 hours	0 / 3	0 / 3	0 / 3	0 / 3
48 hours	0 / 3	0 / 3	0 / 3	0 / 3
72 hours	0 / 3	0 / 3	0 / 3	0 / 3

[a] Redness or chemosis score of 1 not considered a "positive score" according to EPA 870.2400.

Severity of Irritation

Time Post Instillation	Mean Total Score [a]
1 hour	2.0
24 hours	0.0
48 hours	0.0
72 hours	0.0

[a] Draize method of scoring (1944).

DATA REVIEW FOR ACUTE DERMAL IRRITATION TESTING (OCSPP 870.2500)

Product Manager: PM 31 **Reviewer:** J. Williams Jr.
MRID No.: 51475508 **Study Completion Date:** 5/4/2020
Study No.: 23468-20

Testing Laboratory: STILLMEADOW, Inc.
Author: Vincent A. Murphy, Ph.D., DABT

Quality Assurance (40 CFR §160): Included

Test Material: SurfaceWise 2
Dosage: 0.5 mL

Animals: Rabbit, New Zealand albino strain
Sex: 2 Male, 1 Female
Age: ~16 weeks
Weight: Male and Females: 2.9-3.1 kg
Source: Robinson Services, Inc., Mocksville, NC

Summary:

1. **Toxicity Category:** IV
2. **Classification:** Acceptable

Deviations from Guideline 870.2500 and other comments: Relative humidity (60-85%) was at times outside of the recommended range of 30-70%.

Results:

The table below provides the individual Draize scores from four-hour dermal exposures of three female rabbits to 0.5 mL of the test material (as received) applied to intact clipped application sites measuring 6.0 cm^2. No erythema or edema was observed on any treated site. No other dermal effects were observed. Beginning and ending body weight ranges indicated that all animals maintained or gained body weight. The Primary Dermal Irritation Index (PDII) calculated for this test substance was 0.0, and the test material was non-irritating (US EPA, 1988).

Individual Dermal Irritation Scores following the four-hour exposure

Animal No.	Sex	Erythema / Edema			
		Time After Patch Removal			
		30-60 minutes	24 hours	48 hours	72 hours
32-M	M	0 / 0	0 / 0	0 / 0	0 / 0
34-M	M	0 / 0	0 / 0	0 / 0	0 / 0
31-F	F	0 / 0	0 / 0	0 / 0	0 / 0

DATA REVIEW FOR DERMAL SENSITIZATION TESTING (OCSPP 870.2600)

Product Manager: PM 31 **Reviewer:** J. Williams Jr.
MRID No.: 51475509 **Study Completion Date:** 5/4/2020
Study No.: 23469-20

Testing Laboratory: STILLMEADOW, Inc.
Author: Vincent A. Murphy, Ph.D., DABT

Quality Assurance (40 CFR §160): Included

Test Material: SurfaceWise 2
Evaluated concentrations: 25%, 50%, and 100%
Vehicle: Acetone: Olive oil, 4:1 v/v (AOO)
Positive Control Material: alpha-Hexylcinnamaldehyde (HCA; ≥95%) in AOO at concentration of 25%
Species: Mouse/CBA/J
Number/Sex: 25 Females (5/group for test animal, control, and positive control groups)
Weight: 19.9-24.5 g (test and control groups)
Age: 9 weeks
Source: Jackson Laboratory, Bar Harbor, ME

Method: OECD 429: LLNA (individual animal approach).

Summary:
1. SurfaceWise 2 was not a sensitizer under the conditions of this study.
2. **Classification:** Acceptable

Deviations from Guideline 870.2600 and other comments: Relative humidity (31-88%) was at times outside of the recommended range of 30-70%. No preliminary irritancy test was performed (and a different dose selection rationale was not provided).

Results:

Dermal sensitization was not observed in the test groups and negative control group. SI values of 0.6, 0.6, and 0.5 were calculated for the 25%, 50%, and 100% test groups, respectively. The procedure was validated with a SI for the positive control group of 3.4. No clinical signs of toxicity were noted in control or test group animals. All animals survived to study termination. Although some mice lost body weight during the study, body weight changes were similar between control and treatment groups. SurfaceWise 2 is not a sensitizer under the conditions of this study.

Animal Group	Dose Preparation	Mean dpm ± SD	Number of Animals	SI
Vehicle control	AOO	2443 ± 462	5	---
Test Group	25% Test Substance in AOO	1534 ± 463	5	0.6
Test Group	50% Test Substance in AOO	1344 ± 483	5	0.6
Test Group	100% Test Substance	1136 ± 248	5	0.5
Positive control	25% HCA in AOO	8294 ± 1464	5	3.4