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

AUG 20 1981

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

DATE: July 20, 1981

SUBJECT: Results from Acute Eye Irritation Studies of Different Formulations of DEET CASWELL #346

FROM: Carolyn Gregorio, Toxicologist CAB
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THRU: Tom Edwards, Acting Section Head 7E
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Laboratory: Department of the Army
U.S. Army Environmental Hygiene Agency
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Toxicology Data Review

1. Primary Eye Irritation in Rabbits using 100% Technical Grade DEET, (Project No. 75-51-0034-81, Department of the Army, Submitted by the Department of the Army, Study completed January 1981).

0.1 ml of 100% Technical DEET was placed on the everted lowered lid of one eye of each of 9 New Zealand White rabbits and held gently for 1 second before releasing. 6 animals did not have their eyes washed subsequent to instillation; 3 rabbits had their treated eye flushed for 1 minute with tap water 20-30 seconds after instillation. Observation of ocular lesion were conducted at 1, 2, 3, and 7 days. Draize technique for scoring was used.

Draize scores for washed eyes:

Time of Reading Hrs-Days	Structure	Scores						Score
		Rabbit No.						
		70	71	72	73	74	75	
24	cornea	5	20	20	15	40	15	115
	iris	0	5	5	0	5	5	20
	conjunctivae	4	8	6	8	8	12	46
48	cornea	0	15	15	10	40	10	90
	iris	0	5	5	0	5	5	20
	conjunctivae	0	4	4	0	6	4	16
72	cornea	0	10	10	5	20	5	50
	iris	0	5	5	0	5	5	20
	conjunctivae	0	4	0	0	6	4	14
7 days	cornea	0	0	0	0	0	0	0
	iris	0	0	0	0	0	0	0
	conjunctivae	0	0	0	0	0	0	0



Draize scores for unwashed eyes:

Time of Reading Hrs-Days	Structure	Scores			Score
		Rabbit No.			
		94	95	96	
24	cornea	15	5	15	35
	iris	0	0	0	0
	conjunctivae	4	4	8	16
48	cornea	5	0	15	5
	iris	0	0	5	0
	conjunctivae	2	0	4	2
72	cornea	5	0	10	5
	iris	0	0	5	0
	conjunctivae	2	0	0	2
7 days	cornea	0	0	0	0
	iris	0	0	0	0
	conjunctivae	0	0	0	0

Toxicity Category: II

Classification: Core-Minimum

2. Primary Eye Irritation in Rabbits using 75% Solution of DEET in Denatured EtOH, (Project No. 75-51-0031-81, Department of the Army, Submitted by the Department of the Army, Study completed January 1981).

0.1 ml of 75% DEET in denatured ethanol was placed on the everted lower lid of one eye of each of 9 New Zealand White rabbits and held gently for 1 second before releasing. 6 animals did not have their eyes washed subsequent to instillation; 3 rabbits had their treated eye flushed for 1 minute with tap water 20-30 seconds after instillation. Observation of ocular lesions were conducted at 1, 2, 3, and 7 days. Draize technique for scoring was used.

Draize scores for unwashed eyes:

Time of Reading Hrs-Days	Structure	Scores						Score
		Rabbit No.						
		76	77	78	79	80	81	
24	cornea	40	15	20	40	15	20	150
	iris	5	5	5	5	5	5	30
	conjunctivae	8	8	14	6	12	6	54
48	cornea	40	20	15	30	10	20	135
	iris	5	5	5	5	5	5	30
	conjunctivae	6	6	6	6	6	4	34
72	cornea	30	5	10	20	5	20	90
	iris	5	5	5	5	5	5	30
	conjunctivae	4	4	6	3	3	4	24
7 days	cornea	0	0	0	0	0	0	0
	iris	0	0	0	0	0	0	0
	conjunctivae	0	0	0	0	0	0	0

Draize scores for washed eyes:

Time of Reading Hrs-Days	Structure	Scores			Score
		Rabbit No.			
		94	95	96	
24	cornea	20	20	40	80
	iris	5	5	5	15
	conjunctivae	14	12	14	40
48	cornea	0	10	20	30
	iris	0	5	5	10
	conjunctivae	8	6	8	22
72	cornea	0	5	15	20
	iris	0	5	5	10
	conjunctivae	2	4	6	12
7 days	cornea	0	0	0	0
	iris	0	0	0	0
	conjunctivae	0	0	0	0

Toxicity Category: II

Classification: Core-Minimum

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3. Primary Eye Irritation in Rabbits using 50% Solution of DEET in Denatured Ethanol, (Project No. 75-51-0034-81, Department of the Army, Submitted by the Department of the Army, Study completed January 1981).

0.1 ml of 50% DEET in denatured ethanol was placed on the everted lower lid of one eye of each of 9 New Zealand White rabbits and held gently for 1 second before releasing. 6 animals did not have their eyes washed subsequent to instillation; 3 rabbits had their treated eye flushed for 1 minute with tap water 20-30 seconds after instillation. Observation of ocular lesions were conducted at 1, 2, 3, and 7 days. Draize technique for scoring was used.

Draize scores for unwashed eyes:

Time of Reading Hrs-Days	Structure	Scores						Score
		Rabbit No.						
		70	71	72	73	74	75	
24	cornea	20	20	40	40	20	20	160
	iris	5	5	5	5	5	5	30
	conjunctivae	6	14	12	12	12	10	60
48	cornea	20	40	40	40	20	20	180
	iris	5	5	5	5	5	5	30
	conjunctivae	4	6	12	10	8	8	48
72	cornea	20	20	40	40	40	20	180
	iris	5	5	5	5	5	5	30
	conjunctivae	6	6	8	8	6	6	40
7 days	cornea	0	0	10	10	5	40	65
	iris	0	0	5	5	0	5	15
	conjunctivae	0	0	3	2	2	4	11
8 days	cornea	0	0	5	5	5	5	20
	iris	0	0	5	5	0	5	15
	conjunctivae	0	0	2	0	0	4	6
9 days	cornea	0	0	5	5	0	5	15
	iris	0	0	0	0	0	5	5
	conjunctivae	0	0	2	0	0	2	4
14 days	cornea	0	0	5	5	0	5	15
	iris	0	0	0	0	0	5	5
	conjunctivae	0	0	0	0	0	0	0

Draize scores for washed eyes:

Time of Reading Hrs-Days	Structure	Scores			Score
		Rabbit No.			
		102	103	104	
24	cornea	30	40	10	80
	iris	5	5	0	10
	conjunctivae	10	12	6	28
48	cornea	10	20	5	35
	iris	5	5	5	15
	conjunctivae	10	8	2	20
72	cornea	0	20	0	20
	iris	5	5	0	10
	conjunctivae	6	2	0	8
7 days	cornea	0	10	0	10
	iris	0	5	0	5
	conjunctivae	0	2	0	2
8 days	cornea	0	5	0	5
	iris	0	5	0	5
	conjunctivae	0	2	0	2
9 days	cornea	0	5	0	5
	iris	0	0	0	0
	conjunctivae	0	0	0	0
14 days	cornea	0	5	0	5
	iris	0	0	0	0
	conjunctivae	0	0	0	0

Toxicity Category: I

Classification: Core-Minimum

4. Primary Eye Irritation in Rabbit using 100% Denatured Ethanol,
 (Project No. 75-51-0034-81, Department of the Army, Submitted by
 the Department of the Army, Study completed January 1981).

0.1 ml of 100% denatured ethanol was placed on the everted lower lid of one eye of each of 9 New Zealand White rabbits and held gently for 1 second before releasing. 6 animals did not have their eyes washed subsequent to instillation; 3 rabbits had their treated eye flushed for 1 minute with tap water 20-30 seconds after instillation. Observation of ocular lesions were conducted at 1, 2, 3, and 7 days. Draize technique for scoring was used.

Draize scores for unwashed eyes:

Time of Reading Hrs-Days	Structure	Scores						Score
		Rabbit No.						
		88	89	90	91	92	93	
24	cornea	10	30	40	15	5	20	120
	iris	0	5	5	5	0	5	20
	conjunctivae	12	12	16	8	6	10	64
48	cornea	10	20	30	10	0	20	90
	iris	0	5	5	5	0	5	20
	conjunctivae	8	14	10	2	0	6	40
72	cornea	0	5	5	5	0	20	35
	iris	0	5	5	0	0	5	15
	conjunctivae	4	6	6	2	0	4	22
7 days	cornea	0	0	0	0	0	5	5
	iris	0	0	0	0	0	0	0
	conjunctivae	0	0	0	0	0	4	4
8 days	cornea	0	0	0	0	0	5	5
	iris	0	0	0	0	0	0	0
	conjunctivae	0	0	0	0	0	2	2
9 days	cornea	0	0	0	0	0	5	5
	iris	0	0	0	0	0	0	0
	conjunctivae	0	0	0	0	0	0	0
14 days	cornea	0	0	0	0	0	0	0
	iris	0	0	0	0	0	0	0
	conjunctivae	0	0	0	0	0	0	0

Draize scores for washed eyes:

Time of Reading Hrs-Days	Structure	Scores			Score
		Rabbit No.			
		106	107	108	
24	cornea	10	10	40	60
	iris	5	0	5	10
	conjunctivae	12	8	10	30
48	cornea	5	5	40	50
	iris	0	0	5	5
	conjunctivae	4	4	10	18
72	cornea	5	0	40	45
	iris	0	0	5	5
	conjunctivae	2	0	6	8
7 days	cornea	0	0	5	5
	iris	0	0	0	0
	conjunctivae	0	0	2	2
8 days	cornea	0	0	5	5
	iris	0	0	0	0
	conjunctivae	0	0	2	2
9 days	cornea	0	0	5	5
	iris	0	0	0	0
	conjunctivae	0	0	0	0
14 days	cornea	0	0	0	0
	iris	0	0	0	0
	conjunctivae	0	0	0	0

Toxicity Category: II

Classification: Core-Minimum

5. Primary Eye Irritation in Rabbit using Federal Specification Insect Repellent*, (Project No. 75-51-0034-81, Department of the Army, Submitted by the Department of the Army, Study completed January 1981).

*Federal Specification (0-I-503b) Insect Repellent:

DEET	71.25%
Other diethyltoluamides	3.25%
Denatured Ethanol	25.00%

0.1 ml of Federal Specification Insect Repellent was placed on the everted lower lid of one eye of each of 9 New Zealand White rabbits and held gently for 1 second before releasing. 6 animals did not have their eyes washed subsequent to instillation; 3 rabbits had their treated eye flushed for 1 minute with tap water 20-30 seconds after instillation. Observation of ocular lesions were conducted at 1, 2, 3, and 7 days. Draize technique for scoring was used.

Draize scores for unwashed eyes:

Time of Reading Hrs-Days	Structure	Scores						Score
		Rabbit No.						
		70	71	72	73	74	75	
24	cornea	40	40	40	40	40	40	240
	iris	5	5	5	5	5	5	30
	conjunctivae	8	8	10	8	10	8	52
48	cornea	15	15	15	10	40	40	160
	iris	5	5	5	0	5	5	25
	conjunctivae	2	4	4	4	6	6	26
72	cornea	15	10	40	5	40	40	150
	iris	5	0	5	0	5	5	20
	conjunctivae	2	2	6	4	8	2	22
7 days	cornea	0	0	0	0	0	0	0
	iris	0	0	0	0	0	0	0
	conjunctivae	0	0	0	0	0	0	0

Draize scores for washed eyes:

Time of Reading Hrs-Days	Structure	Scores			Score
		Rabbit No.			
		116	117	118	
24	cornea	20	20	15	55
	iris	5	5	5	15
	conjunctivae	12	2	8	22
48	cornea	5	20	5	30
	iris	5	0	5	10
	conjunctivae	6	2	10	18
72	cornea	0	10	0	10
	iris	0	0	5	5
	conjunctivae	4	4	4	10
7 days	cornea	0	0	0	0
	iris	0	0	0	0
	conjunctivae	0	0	0	0

Toxicity Category: II

Classification: Core-Minimum

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