

OFFICE OF TOXIC SUBSTANCES
CODING FORM FOR GLOBAL INDEXING

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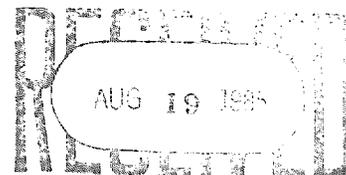
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Report 23-25

MELLON INSTITUTE OF INDUSTRIAL RESEARCH
UNIVERSITY OF PITTSBURGH

SPECIAL REPORT

Range Finding Tests on Butoxy TriglycolUnion Carbide Chemicals Co., U.C.C.

Industrial Fellowship 27-23

Summary

Stomach Intubation, rat - $LD_{50} = 6.73$ ml./kg.
Skin Penetration, rabbit - $LD_{50} = 3.54$ ml./kg.
Inhalation, rat
Concentrated Vapor - 8 hours killed 0 of 6
Uncovered Skin Irritation, rabbit - minor, Grade 3
Eye Injury, rabbit - moderate, Grade 5

Butoxy triglycol is slightly toxic by stomach intubation and moderately toxic by skin penetration. The undiluted fluid causes only minor irritation on the uncovered skin but is capable of burning eye tissue. It presents no hazard by inhalation of vapor generated at room temperature.

For comparison, butoxy triglycol is about twice as toxic as methoxy triglycol by the peroral route and by skin penetration. Neither of these triglycols are hazardous by inhalation of vapor generated at room temperature. However, methoxy triglycol is essentially innocuous by eye and uncovered skin contact, while undiluted butoxy triglycol presents a definite hazard to eyes.

Sample

Two 8-ounce quantities of butoxy triglycol bearing identification S-282473, were received from South Charleston on December 29, 1959, for toxicity assays.

Single Peroral Doses

Butoxy triglycol has an LD_{50} of 6.73 (4.13 to 10.96) ml./kg. when administered undiluted in single doses to male albino rats by stomach intubation.

Dow-Wistar non-fasted rats, five to six weeks of age and 90-120 grams in weight, were dosed at levels differing by a factor of 2.0 in a geometric series. The rats were reared in our own colony and maintained from time of weaning on Rockland rat diet (complete). The method of moving average for calculating the median-effective dose (LD_{50}) was applied to the 14-day mortality data.

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Death was rapid, usually occurring within one hour after dosing. Autopsy disclosed a generalized congestion of the abdominal viscera and lungs.

Skin Penetration

In the rabbit skin penetration test, the LD₅₀ is 3.54 (2.06 to 11.85) ml./kg. undiluted. Marked erythema of the skin was found upon removal of the VINYLITE covering after a 24-hour contact period. Fourteen days later, some small scabs and extensive desquamation were present.

Male albino New Zealand strain rabbits, three to five months of age and averaging 2.5 kg. in weight, were immobilized during the 24-hour skin contact period. Thereafter, the VINYLITE sheeting used to retain the dose in contact with the clipped skin of the trunk was removed and the animals were caged for the remainder of the 14-day observation period. The rabbits were procured locally and maintained on Rockland rabbit ration. The moving average method of calculating the LD₅₀ was used.

Most deaths were delayed from three to nine days after the application of the chemical. Findings upon autopsy were as follow: lungs--cherry red and hemorrhaged; livers--dark, mottled with prominent acini; kidneys--pale and mottled.

Inhalation

Concentrated vapor, generated at a mean temperature of approximately 25°C. by passing air at 2.5 liters/minute through a fritted glass disc immersed in 50 ml. of butoxy triglycol, caused no mortality among six McWistar, female albino rats that inhaled the vapor-air mixture for eight hours and who were observed subsequently for a total of 14 days. All animals appeared normal upon removal from the inhalation chamber but at sacrifice two weeks later, evidence of residual lung damage and pale mottled livers were observed.

Some condensation was noted on the roof and walls of the inhalation chamber.

Irritation

Application of 0.01 ml. amounts of butoxy triglycol to the uncovered clipped skin of the rabbit belly produced marked capillary injection on four animals and moderate injection on the fifth. Grade 3.

Rabbit eyes were necrosed by the instillation of 0.02 ml. amounts of this material but only minor to moderate injury resulted from the instillation of 0.005 ml. Grade 5.

Charles P. Carpenter

Jean A. Striegel

Typed: March 30, 1960

Charles P. Carpenter
ASSISTANT ADMINISTRATIVE FELLOW

Jean A. Striegel
JUNIOR FELLOW

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Table 23-84

Butoxy Triglycol (22-282)

Single Doses to Male Albino Rats Fed Undiluted by Stomach Tube

<u>Rat Number</u>	<u>1959 Date Dosed</u>	<u>Grams Weight</u>	<u>Weight Change in 14 Days</u>	<u>Dosage; Ml. per Kilo</u>	<u>Dose in Ml.</u>	<u>Days to Death</u>
94154	12-30	112	-	16.0	1.8	0
94158	12-30	107	-	16.0	1.7	0
96165	12-30	105	-	16.0	1.7	0
94175	12-30	113	-	16.0	1.8	0
94193	12-30	104	-	16.0	1.7	0
96207	12-30	108	-	8.0	0.86	0
96250	12-30	97	-	8.0	0.78	0
96231	12-30	120	-	8.0	0.96	0
96253	12-30	94	+38	8.0	0.75	-
96375	12-30	95	+48	8.0	0.76	-
96190	12-30	118	-	4.0	0.47	0
96233	12-30	108	+47	4.0	0.43	-
96229	12-30	118	+61	4.0	0.47	-
96191	12-30	109	+46	4.0	0.44	-
96383	12-30	96	+48	4.0	0.38	-

LD₅₀ = 6.73 (4.13 to 10.96) ml./kg.

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Table 23-85

Butoxy Triglycol (22-282)

878216157

Single Doses to Male Albino Rabbits by Skin Penetration

Administered Undiluted under VINYLITE Dam for 24 Hours

Rabbit Number	1960 Date Clipped	1960 Date Applied	Grams Weight	Weight Change In 14 Days	Dosage; ML. per Kilo	Dose in ML.	Days to Death
94828	1-13	1-14	3312	-	10.0	33.1	3
94888	2-24	2-25	2965	-	10.0	29.6	3
94918	2-24	2-25	2646	-	10.0	26.5	1
94897	2-24	2-25	2920	-110	10.0	29.2	-
94894	2-8	2-9	3050	-	5.0	15.2	6
94921	2-24	2-25	2702	-	5.0	13.5	4
94885	2-8	2-9	2868	+106	5.0	14.3	-
94898	2-8	2-9	3176	+146	5.0	15.9	-
94834	1-18	1-19	2944	-	2.5	7.4	9
94829	1-25	1-26	3088	-	2.5	7.7	3
94851	1-25	1-26	2816	-	2.5	7.0	-
94852	1-25	1-26	2424	-	2.5	6.1	-
94869	2-1	2-2	3288	-	1.25	4.1	5
94873	2-1	2-2	3084	+ 51	1.25	3.9	-
94875	2-1	2-2	2706	0	1.25	3.4	-
94877	2-1	2-2	2650	-750	1.25	3.3	-

LD₅₀ = 3.54 (1.06 to 11.85) ml./kg.

Table 23-86

Butoxy Triglycol (22-282)

Single Inhalation by Female Albino Rats

of Concentrated Vapor Generated at Approximately 24.8°C.

Rat Number	Date and Duration of Inhalation	Initial Weight Grams	Weight Change in 14 Days	Days to Death
96060		114	+26	-
96061	1/5/60	120	+22	-
96063	8 Hours in	102	+23	-
96064	9-Liter	102	+20	-
96065	Desiccator	116	+34	-
96066		126	+28	-

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