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Re: 3-3-41
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MELLON INSTITUTE OF INDUSTRIAL RESEARCH
University of Pittsburgh

AUG 3 1941

PROGRESS ~~REPORT~~ the Month ended ~~March 1941~~
Carbide & Carbon Chemicals Corporation Industrial Fellowship No. 274-4

Subjects under)
which report is)
to be indexed)

CONTAINS NO CBI

Reports

Three special reports were issued during the month, covering mucous membrane irritation from "Carbowax" 4000, single doses of methyl "Carbitol" to rabbits, and repeated doses of plasticized "Vinylite" films by mouth.

Single Doses by Mouth

Relatively few single doses were administered this month. Results to date appear in Table 4-38 below.

Table 4-38Single Doses by Mouth - 4-28-61

	<u>Rats</u>		<u>Guinea Pigs</u>	
	<u>Rats Fed</u>	<u>Estimate of LD50</u>	<u>Pigs Fed</u>	<u>Estimate of LD50</u>
Aerosol OT	51	19.* gm/kg.	-	-
Anine 220E	46	1.0* "	88	0.3* gm/kg.
Di-2-chlorethyl formal	6	<0.08 "	-	-
Ethyl propositolve A	47	11.* "	-	-
Ethyl propositolve B	34	9.* "	-	-
Ivory soap	20	>16. "	-	-
b-Methyl umbelliferone	42	1.05* "	52	1.2 "
Orvus paste (sodium lauryl sulfate)	36	11. "	-	-
Santomerse S	58	4.5* "	-	-
"Tergitol" 4 purified**	28	8 "	-	-

*Final data

**Expressed in gm/kg. of a 25% solids solution for comparison with commercial grade

The LD₅₀ of "Cellosolve" to rabbits by mouth was found to be 2.5 gm/kg., between that for rats and that for guinea pigs but closer to the former.

of "Carbitol"

Doses have been administered to rats to determine the smallest dosage producing kidney injury, to supplement single dose information already available.

All LD₅₀'s so far reported have been determined graphically from a plot of the data. We have redetermined a large number by the more precise method of probits and any publication of results will carry data calculated by this method. Usually the probit method produces unimportant changes in LD₅₀'s estimated from curves.

H. F. Smyth, Jr.

Repeated Doses by Mouth

Rats which had received 90 daily doses of Plasticizer 3GH were sacrificed for examination during the month. These animals showed no marked effect. Tissues will be examined.

Rats received on 2-20-41 the first of 90 daily doses of Amines 230, 22L, and 220E. No effect is yet evident.

H. F. Smyth, Jr.

Intravenous Doses

On the basis of results of repeated oral doses, it appears possible that "Carbowax" 4000 may be quite toxic when it reaches the circulation, but in single oral doses that it is but little absorbed. To check on this, its toxicity by intravenous injection is being studied. Six rats receiving a dosage of 1 gm/kg. did not die.

C. P. Carpenter

Single Skin Applications

Single skin applications of "Carbitol" are being made to determine the effect of dilution and of brief contact upon absorption by the guinea pig. Applications of glyoxalidines are not yet completed.

The lubricating oils and their mixtures with addition agents listed on page three of the monthly report dated 1-31-41 were left in contact with guinea pig skins for 4 days. No local injury or death were produced. This test appears to be less sensitive than the rabbit belly test discussed in the January report.

H. F. Smyth, Jr.

Repeated Skin Absorption

Guinea pigs are receiving five times a week applications of 1 gm/kg. of "Carbitol" and "Carbowax" 4000 held in contact with the skin for one day. Because of the small number of animals being used, this is regarded as a preliminary check on the method of bandaging the pigs. After two weeks the repeated severe handling and the restrictive bandage have allowed two deaths from pneumonia, one of them in a control animal receiving water. The pigs lose weight while the bandage is on, but regain it during Saturday and Sunday when it is off.

C. P. Carpenter

Skin Irritation

A 5 per cent solution of Amine 220 and of Amine 22L in paraffin oil produced erythema and edema; a 0.1 per cent solution produced no reaction in the rabbit belly technic. Intermediate solutions produced intermediate reactions. These glyoxalidines as 5 per cent solutions in oil would be classed as vesicants.

A polypentachlorostyrene on the rabbit belly produced no irritation as a 10 per cent solution in kerosene. Hexachlornaphthalene ("Halowax" 1014) in comparative tests produced a slowly developing erythema when applied in 0.1 per cent solution, and thus appears to be much more of a skin irritant.

Chloracne production from the two last materials is being studied by daily applications of 1 and 5 per cent olive oil solutions to the rabbit ear. The hexachlornaphthalene is known to be an active producer of this condition and is included for comparison. After two weeks it appears that polypentachlorostyrene will produce the hyperkeratosis characteristic of chloracne, but to a less extent than does hexachlornaphthalene. The applications will probably be continued to 30 days.

C. P. Carpenter

Human Skin Applications

Data bearing on the production of dermatitis from certain products have been obtained this month. The test consists of seven days' contact with human skin, ten days rest to allow development of allergic sensitivity, and two days reapplication to detect the sensitivity. Results appear in Table 4-39 below. For comparison, certain other tests previously made are included in the table.

Table 4-39

Human Skin Applications 2-25-41

Material	Sub- jects	A. Trace Reactions Included			B. Definite Reactions Only		
		Add'n Re-		Total	Add'n Re-		Total
		2-Day	7-Day test	%	2-Day	7-Day test	%

2-ethyl hexanol | 6 | 2 | 2 | 1 | 83* || 2* | 0 | 1* | 50*

*One or more reactions consisted of marked erythema or vesicles.

The test is necessarily more severe than most probable human contacts with the materials, so the percentage of reactions found must not be taken to indicate the actual proportion of human users expected to develop dermatitis from frequent contact. Because some materials showed very little effect, it was necessary to include trace reactions in the table, to get comparative data. They are probably of no significance in judging results of widespread human use of the samples tested.

6. 2-Ethyl hexanol is undesirable for prolonged contact in high concentrations with the skin.

H. F. Smyth, Jr.

Henry F. Smyth, Jr.

Henry F. Smyth, Jr.
SENIOR INDUSTRIAL FELLOW

Charles P. Carpenter

Charles P. Carpenter
INDUSTRIAL FELLOW

March 4, 1941-mah

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