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REVISED 10/15/86

Microfiche No.

OTS0543760

New Doc I.D.

88-920006688

Old Doc I.D.

8EHQ-0892-2042

Date Produced

5/04/55

Date Recieved

6/25/92

TSCA section

AECP

Submitting Organization

UNION CARBIDE CORP

Contractor

MELLON INST INDUS RES

Document Title

INITIAL SUBMISSION: RESULTS ON THE SEVENTH MOUSE SKIN-PAINTING STUDY WITH COVER SHEET AND LETTER DATED 061992

Chemical Category

HALOWAX 1014

8042

8(e)

CAP

(COMPLIANCE AUDIT PROGRAM)

TSCA CONFIDENTIAL BUSINESS INFORMATION

ORIGINAL - DCO (Jeff/Eric)

COPY # 1 - CBIC

COPY # 2 - Scott Sherlock

COMPANY SANITIZED

ORIGINAL - PINS

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CONTAINS NO CBI

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UNION CARBIDE

UNION CARBIDE CORPORATION 39 OLD RIDGEBURY ROAD, DANBURY, CT 06817-0001

8EHQ-0892-8042

August 19, 1992

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8EHQ-92-8042
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88920006688

Attn: Section 8(e) Coordinator (CAP Agreement)

Re: CAP Agreement Identification No. 8ECAP-0110

Dear Sir or Madam:

Union Carbide Corporation ("Union Carbide") herewith submits the following report pursuant to the terms of the TSCA §8(e) Compliance Audit Program and Union Carbide's CAP Agreement dated August 14, 1991 (8ECAP-0110). This report describes the results of mouse skin-painting toxicity studies with several materials. The following compositions were shown to have a high tumor incidence: tar residue (#30 medium pitch), "A" Kettle residue, pasting oil, pitch residue, crude (raw) wash oil, coal tar (pasting) and Dripolene A/B sludge (no CASRN's are available for any of these materials):

"Results of the Seventh Mouse Skin-Painting Study", Mellon Institute of Industrial Research (University of Pittsburgh), Report 18-109, August 4, 1955.

A complete summary of this report is attached.

Previous TSCA Section 8(e) or "FYI" Submission(s) related to this substance are:

(None)

Previous PMN submissions related to this substance are: (None)

18-109

This information is submitted in light of EPA's current guidance. Union Carbide does not necessarily agree that this information reasonably supports the conclusion that the subject chemical presents a substantial risk of injury to health or the environment.

In the attached report the term "CONFIDENTIAL" may appear. This precautionary statement was for internal use at the time of issuance of the report. Confidentiality is hereby waived for purposes of the needs of the Agency in assessing health and safety information. The Agency is advised, however, that the publication rights to the contained information are the property of Union Carbide.

Yours truly,

William C. Kuryla, Ph.D.
Associate Director
Product Safety
(203/794-5230)

WCK/cr
Attachment (3 copies of cover letter, summary, and report)

SUMMARY

Confidential

Report 18-109

R: 8-4-55

MELLON INSTITUTE OF INDUSTRIAL RESEARCH

UNIVERSITY OF PITTSBURGH

SPECIAL REPORT

on

Results of the Seventh Mouse Skin-Painting Study

Carbide and Carbon Chem. Co., U.C.C. Industrial Fellowship No. 274-18

Summary

In the seventh mouse skin-painting study, groups of approximately 30 Rockland C_3H mice received 3 applications per week on their clipped skin for one year. The following materials were tested: HALOWAX 1014, Dripolene A and B sludge, tar residue (#30 medium pitch from Barrett), "A" kettle residue, light product residue, pasting oil, coal tar oil (pasting oil from Reilly), pitch residue, crude (raw) wash oil and the positive control material - methyl cholanthrene.

These samples - with the exception of the pitch from Barrett and HALOWAX 1014 - represented current production of materials previously tested in this laboratory on this test. All of these, except raw wash oil, had previously been shown tumorigenic. Again, all of those previously tumorigenic were shown highly active tumor and cancer producers. This time raw wash oil was also carcinogenic. Of the above listed materials, only HALOWAX 1014 and Dripolene A and B sludge were non-tumorigenic.

Confidential

Report 18-109

7-7-55

MELLON INSTITUTE OF INDUSTRIAL RESEARCH

UNIVERSITY OF PITTSBURGH

SPECIAL REPORT

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These samples - with the exception of the pitch from Barrett and HALOWAX 1014 - represented current production of materials previously tested in this laboratory on this test. All of these, except raw wash oil, had previously been shown tumorigenic. Again, all of these previously tumorigenic were shown highly active tumor and cancer producers. This time raw wash oil was also carcinogenic. Of the above listed materials, only HALOWAX 1014 and Dripolene A and B sludge were non-tumorigenic.

Samples Used

(1) "A" - kettle residue (17-87) - 1 quart received 4-12-54 from South Charleston. This sample bore the identification number GR-10919.

(2) Pasting oil (17-123) - 1 quart received 5-10-54 from the Coal Depolymerization unit of the Institute Plant. Identification SU-15,000 to SU-20,000 blend. The following is a quotation from a letter of 5-4-54 from G. O. Walker to Dr. H. F. Smyth, Jr. "This sample is representative of the combined distillates from the pasting oil stills - the stream which is recycled to the high pressure system as vehicle for the coal. Although it is normal practice to blend purchased coal tar oil with this stream to form the vehicle, this sample was obtained prior to this addition such that it will not be directly affected by this additive. The pasting oil sample provided for your first test contained coal tar oil."

(3) Light oil column residue (17-122) - 1 quart received 5-10-54 from Institute. Identification number SU-10,000. From the above Walker letter - "This material is recovered at the same point in the process as the sample designated 'Light Product Residue' in the first batch. However, due to process variation, the content of high boiling oil has increased such that this stream now contains the bulk of the raw wash oil fraction plus materials boiling in the pasting oil fraction."

(4) Pitch (17-124) - 1 quart received 5-10-54 from Institute. Identification SU-20,000. Tested as a 10% benzol solution. From the Walker letter - "This material approximates your initial sample (pitch residue), varying possibly in such physical characteristics as boiling range, softening point, and ash content."

(5) Raw wash oil (17-125) - 1 quart received 5-10-54 from Institute. Identification SU-25,000. From the Walker letter - "This samples varies from that initially supplied (crude wash oil) because of an increased concentration of high boiling oils. It possibly contains certain fractions not present in the light oil column residue, due to the addition of an extraneous stream (recovered oil) after this column."

(6) Coal tar oil (17-126) - 1 quart received 5-10-54 from Institute. Identification SUR-46. From the Walker letter - "This is a sample of a specific tank car of coal tar (creosote) oil, as received from the Cleveland, Ohio, Plant of Reilly Tar and Chemical Corporation. Coal tar oil is blended with the plant-produced pasting oil fraction as required to maintain a vehicle balance."

(7) Pitch - #30 medium (17-85) - 1.5 pounds received 4-9-54 from National Carbon Co., Inc. - Fostoria, Ohio, Works. According to a letter from R. M. Bushong to Dr. T. W. Nale (April 6, 1954) "the sample selected is our most commonly used pitch, a coal tar distillation residue purchased from Barrett Co. at Detroit and known as #30 medium. We ordinarily use the pitch in a crushed state with sizing from 1/2" and finer. We have milled the sample to a powder for your convenience. The standard control tests performed on this pitch gave the following results:"

Melting point	99°C.
Benzol insoluble	28.3%
Ash	0.14%
Quinoline insoluble	15.0%

The can was labelled "12-8-53, #30 medium pitch. N.Y.C. #100 182, 10th car." It was tested at 10% in benzol.

(8) Dripolene A and B sludge (17-163) - 1 quart received 6-11-54 from the Institute Plant. According to a letter from Dr. R. J. Sexton to Mr. C. H. Atwood of 5-24-54 "recently I corresponded with Dr. Smyth regarding Dripolene A and B sludge from our Plant Gas Department. Since the Coal Hydrogenation Plant is planning on using this product as a wash oil, Dr. Smyth has agreed that it is advisable to test it by mouse painting."

(9) HALOWAX 1014 (10-318) - 5 pounds received 11-6-47 from Wyandotte. Identification batch 561. Tested as 40% in benzol.

(10) 0.2% methyl cholanthrene positive control group.

Experimental Method

The procedure used in this study was the same as that described in the following reports from this laboratory:

Number	Date	Results of
14-60	7-9-51	First mouse skin-painting study
15-30	3-25-52	Second " " " "
15-73	8-22-52	Third " " " "
17-34	2-25-54	Fourth " " " "
17-123	10-27-54	Fifth " " " "
18-11	12-15-54	Sixth " " " "

The procedure was patterned after the method of Smith reported in Cancer, 4: 1232 to 1245, 1951 and in the A.M.A. Arch. Indust. Hyg., 4: 299 to 314, 1951. In brief, groups of 30 C_3H mice (from Rockland Farms) were painted on Monday, Wednes day, and Friday and their hair growth clipped on Tuesday and Thursday of each week for one year of doses. One brushful - number one, series 197 Grumbacher brush, of each chemical was applied at these tri-weekly intervals with the exception of HALOWAX 1014. Six months of paintings of this material were done and the mice observed for the last six months. A high degree of mortality necessitated this change in procedure. The first day of painting was 6-28-54 and the surviving mice dosed with HALOWAX 1014 and pasting oil (17-123) were sacrificed on 6-24-55: the former as no tumors had been observed and the latter as all 3 surviving mice had cancers. The survivors, painted with the other materials on test, were not killed after one year of dosing, but are still alive and being observed. The tables of results indicate 13 months of painting and show, on these active agents, that tumors and carcinomas are still being produced. This report is being written, however, as each of these materials have already been shown to be carcinogenic.

The terms used in this report are defined below:

Term	Definition
Non-tumor mortality	$\frac{\text{Mice dead with no tumor (A)}}{\text{Original number of mice (N)}} \times 100$
Papilloma mortality	$\frac{\text{A + papilloma deaths (B)}}{\text{N}} \times 100$
Cancer mortality	$\frac{\text{A + B + cancer deaths}}{\text{N}} \times 100$
Non-tumor survival	$\frac{\text{No. of mice living with no tumors (D)}}{\text{N}} \times 100$
Papilloma survival	$\frac{\text{D + papilloma survivors (E)}}{\text{N}} \times 100$
Cancer survival	$\frac{\text{D + E + cancer survivors}}{\text{N}} \times 100$
Smith tumor index (T.I.)	$\frac{\text{Number of mice with tumors}}{\text{N-number dead at 90 days with no tumors}} \times 100$

Horton tumor index (T.I.)	$\frac{\text{Number of mice with tumors}}{\text{"Effective group"}} \times 100$
Effective group	Number of mice given adequate exposure. Original number of mice employed less the number that have died without tumors. It is, therefore, a variable number that decreases by one with each non-tumor death. It is arbitrarily held constant after the time of appearance of a tumor in the "average tumor-bearing mouse" - this is designated as the median in a simple arithmetic assay of the times of appearance of the tumors.
Horton cancer index (C.I.)	Like Horton tumor index but cancers instead of tumors.
Average latent period (A.L.P.)	The length of time necessary to reach a 50% tumor index determined by plotting the Horton tumor index versus time. In this study it was calculated by the method of least squares.
Average cancer latent period (A.C.L.P.)	Like A.L.P. but cancers instead of all tumors.

Results

A summary of the results gleaned from this experiment is presented in Table 18-204 and in Figures 1 and 2. More complete listings of results may be found in Tables 18-205 to 18-214 inclusive. Included in the summary table are results of previous testing of similar samples, whenever available.

All of the samples tested, except Dripolene A and B sludge and HALOWAX 1014, were tumorigenic and carcinogenic. As is apparent in Figures 1 and 2, the curves of tumor and cancer production of each active sample were very similar in shape, displaced only along the X axis-time. This difference in average latent period (A.L.P.) is also shown in Table 18-204. The Reilly coal tar oil (17-126) was practically as active as the positive control sample - A.L.P.'s of 5.5 and 4.8 months respectively. The length of time to reach a 50% tumor index was as high as 13.7 months for crude wash oil (17-125) and as 50.6 months for Dripolene A and B sludge. As this latter time is more than double the usual life span of a mouse, this material (A and B sludge) is not considered tumorigenic. Numerically, only 3 papillomas and no carcinomas were found in 30 mice. All of the papillomas appeared before 7 months of painting and 22 of the 30 mice were still alive after 13 months.

The tumor indices and A.L.P.'s were similar to previous results with one major exception - crude wash oil (17-125). Two previous samples were tested in our fourth skin-painting study, (HN-1236-11A and HN-1236-11D) - both were completely negative in reaction. Now, however, 46% of the mice at 12 months had tumors and 23% at 13 months had cancers. As may be seen in the "Sample" section -

Table 18-204

Summary of Results of Seventh Mouse Skin-Painting Study

Material	Sample Number	% in Benzol	Current Results: Horton T.I. at one year unless noted	Current Results: Horton C.I. at one year unless noted	Current Results: Tumor A.L.P., months	Current Results: Cancer A.L.P., months	Previous Results on "Similar" Samples: Horton T.I.	Previous Results on "Similar" Samples: Horton C.I.	Previous Results on "Similar" Samples: Tumor A.L.P., months
Tar residue (#30 medium pitch)	17-85	10.0	94.7	84.2	7.7	9.6	-	-	-
"A" kettle residue	17-87	-	56.5	26.1	11.1	14.1	88.5	61.5	7.0
Light product residue	17-122	-	86.9	39.1	8.6	13.4	46.2	38.5	13.3
Pasting oil	17-123	-	94.4	66.7	7.5	10.6	100.0	100.0	7.5
Pitch residue	17-124	10.0	68.8	12.5	10.7	15.2	76.9	53.8	12.5
Crude (raw) wash oil	17-125	-	46.2	15.4	13.7	18.0	0.0	0.0	~
Coal tar (pasting)	17-126	-	66.7x	41.7x	5.5	8.2	100.0	100.0	7.5
Dripolene A & B sludge	17-163	-	11.5	0.0	50.6	~	-	-	-
HALOWAX 1014	10-318	40.0	0.0	0.0	~	~	-	-	-
Methyl cholanthrene	-	0.2	92.0+	84.0+	4.8	5.6	100.0	100.0	4.8

x = at 8 months

+ = at 10 months

~ = infinity

this current sample has an increased concentration of high boiling oils and possibly contains certain fractions not present in the light oil column residue because of the addition of an extraneous stream (recovered oil) after this column. Other workers have stated that generally higher boiling coal-tar mixtures are more tumorigenic than lower boiling materials. Crude wash oil may be another example of this generalization.

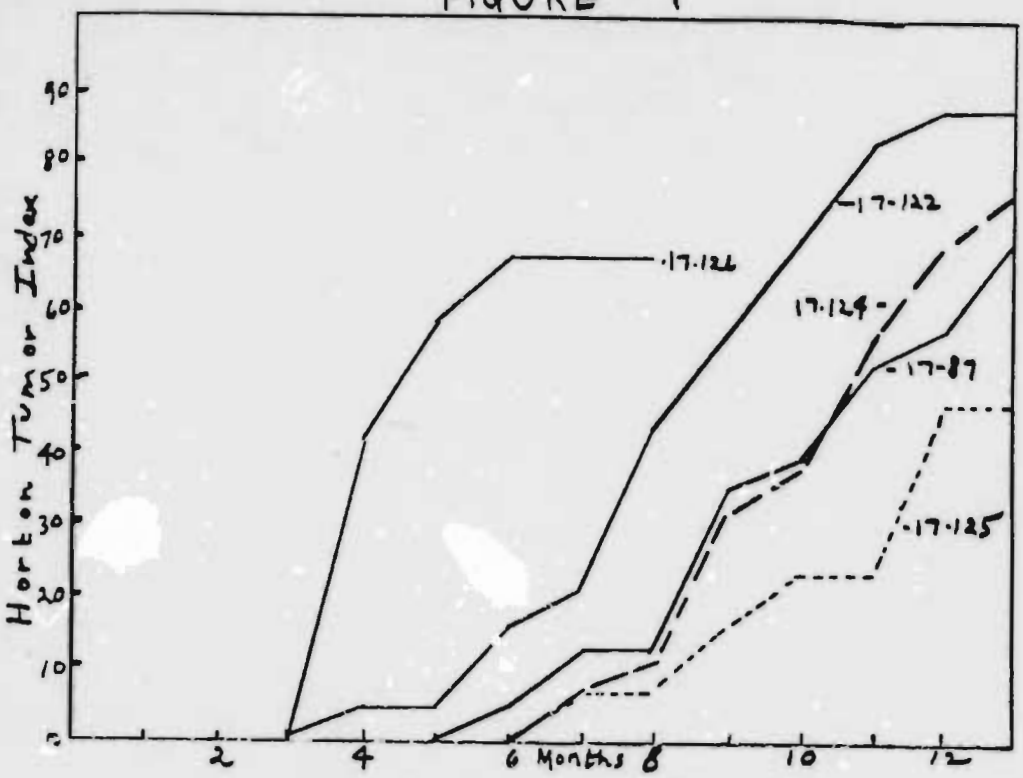
All of the mice that received the Reilly coal tar oil were dead by 8 months. However, as this pasting oil produced tumors and cancers early in the study, this sample was more active than 17-123, the other pasting oil currently tested, as well as more active than the sample previously tested. Furthermore, "A" kettle residue, previously questioned as to activity, was definitely now shown to be carcinogenic on skin painting to mice.

Carrol S. Weil
SENIOR INDUSTRIAL FELLOW

Carrol S. Weil

Typed: August 5, 1955 - mek

FIGURE 1



RELATIONSHIP BETWEEN MONTHS OF PAINTING AND TUMOR INDEX IN SEVENTH MOUSE SKIN PAINTING STUDY

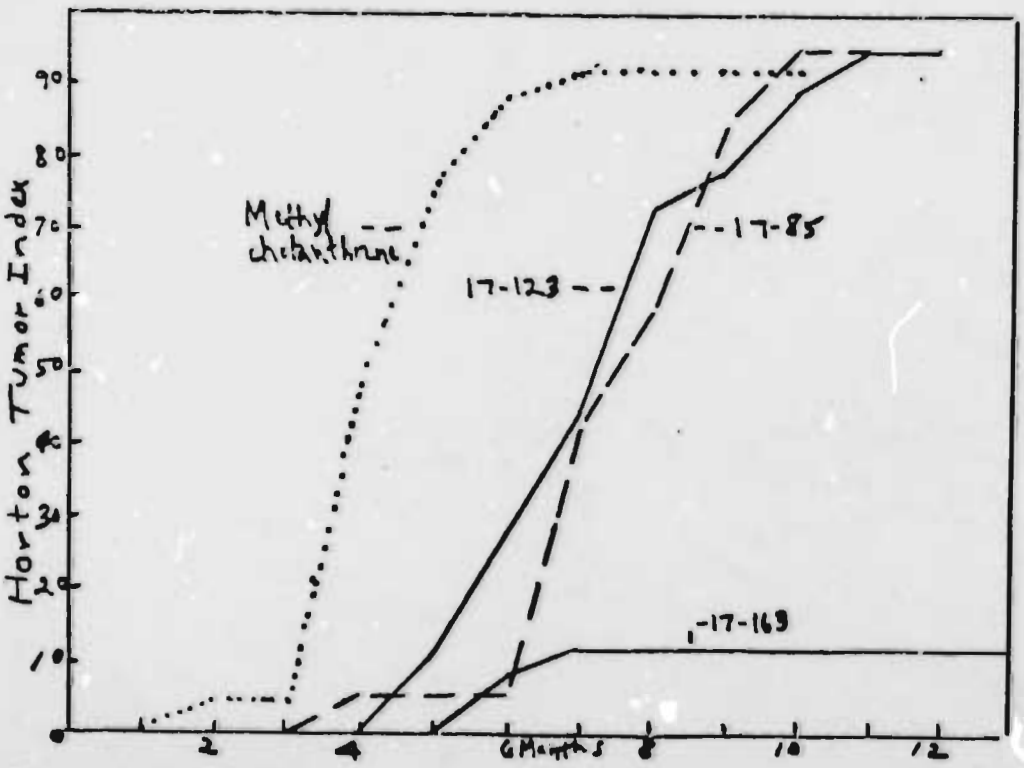
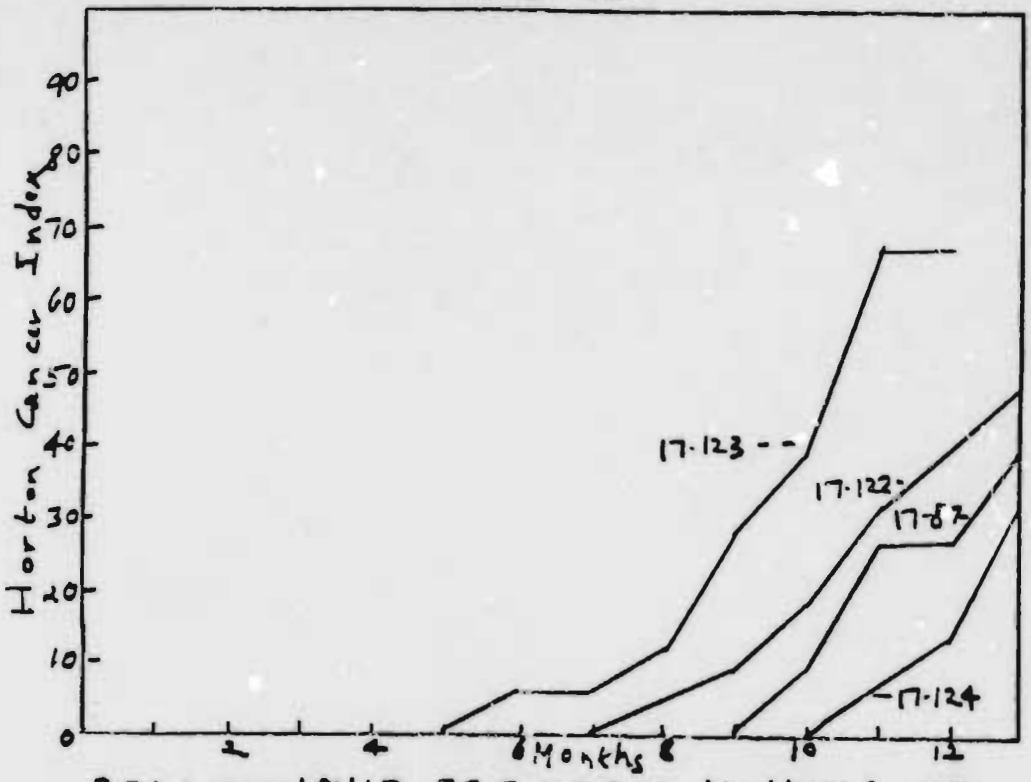


FIGURE 2



RELATIONSHIP BETWEEN MONTHS OF PAINTING AND CANCER INDEX IN SEVENTH SKIN PAINTING STUDY

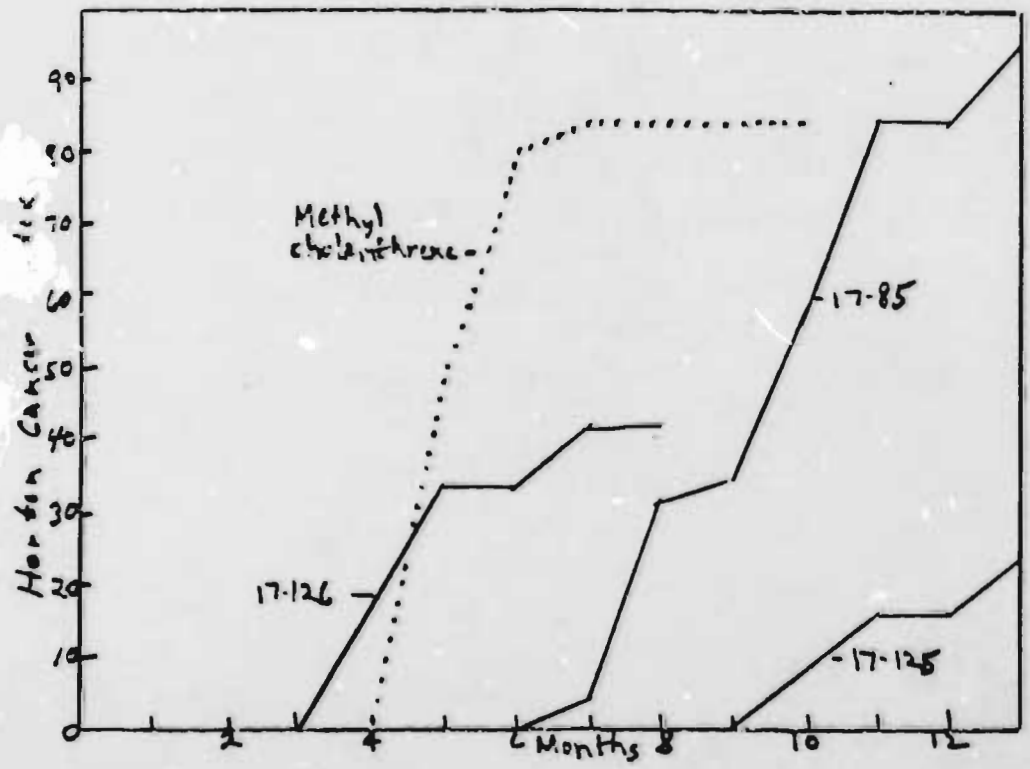


Table 18-205

Results of Skin Painting with "A" Kettle Residue (17-87)

Months of Painting	Percentage Mortality			Percentage Survival			Smith	Horton	
	Non-tumor	Papil-loma	Cancer	Non-tumor	Papil-loma	Cancer	T.I.	T.I.	C.I.
1	10	10	10	90	90	90	0.0	0.0	0.0
2	10	10	10	90	90	90	0.0	0.0	0.0
3	13	13	13	87	87	87	0.0	0.0	0.0
4	13	13	13	87	87	87	0.0	0.0	0.0
5	13	13	13	87	87	87	0.0	0.0	0.0
6	17	17	17	80	83	83	3.8	3.8	0.0
7	17	17	17	73	83	83	11.5	12.0	0.0
8	17	17	17	73	83	83	11.5	13.0	0.0
9	23	23	23	50	77	77	30.8	34.8	0.0
10	23	27	30	47	67	70	34.6	39.1	8.7
11	23	27	33	30	53	67	46.2	52.2	26.1
12	27	33	43	20	47	57	50.0	56.5	26.1
13	30	37	50	17	33	50	61.5	69.6	39.1

Table 18-206

Results of Skin Painting with Light Product Residue (17-122)

Months of Painting	Percentage Mortality			Percentage Survival			Smith	Horton	
	Non-tumor	Papil-loma	Cancer	Non-tumor	Papil-loma	Cancer	T.I.	T.I.	C.I.
1	0	0	0	100	100	100	0.0	0.0	0.0
2	3	3	3	97	97	97	0.0	0.0	0.0
3	10	10	10	90	90	90	0.0	0.0	0.0
4	13	13	13	83	87	87	3.7	3.8	0.0
5	13	13	13	83	87	87	3.7	3.8	0.0
6	13	13	13	73	87	87	14.8	15.4	0.0
7	20	20	20	63	80	80	18.5	20.8	0.0
8	23	23	23	43	73	77	37.0	43.5	4.4
9	23	23	23	33	70	77	48.1	56.5	8.7
10	23	30	30	23	57	70	59.2	69.6	17.4
11	27	33	37	10	43	63	70.4	82.8	30.4
12	27	37	47	7	33	53	74.1	86.9	39.1
13	27	40	60	7	23	40	74.1	86.9	47.8

Table 18-207

Results of Skin Painting with Pasting Oil (17-123)

Months of Painting	Percentage Mortality			Percentage Survival			Smith	Horton	
	Non-tumor	Papil-loma	Cancer	Non-tumor	Papil-loma	Cancer	T.I.	T.I.	C.I.
1	10	10	10	90	90	90	0.0	0.0	0.0
2	17	17	17	83	83	83	0.0	0.0	0.0
3	27	27	27	73	73	73	0.0	0.0	0.0
4	30	30	30	70	70	70	0.0	0.0	0.0
5	37	37	37	57	57	63	9.1	10.5	0.0
6	40	40	40	43	57	60	22.7	27.8	5.6
7	40	40	43	30	57	57	36.4	44.4	5.6
8	43	53	57	13	40	43	59.1	72.2	11.1
9	43	53	57	10	30	43	63.6	77.8	27.8
10	43	57	63	3	20	37	72.7	88.9	38.9
11	43	57	77	0	3	23	77.3	94.4	66.7
12	43	60	90	0	0	10	77.3	94.4	66.7

3 remaining mice killed after 12 months - all 3 had cancer

Table 18-208

Results of Skin Painting with Pitch Residue (17-124)

(1 ml. = 0.1 gm. in benzol)

Months of Painting	Percentage Mortality			Percentage Survival			Smith	Horton	
	Non-tumor	Papil-loma	Cancer	Non-tumor	Papil-loma	Cancer	T.I.	T.I.	C.I.
1	3	3	3	97	97	97	0.0	0.0	0.0
2	7	7	7	93	93	93	0.0	0.0	0.0
3	13	13	13	87	87	87	0.0	0.0	0.0
4	27	27	27	73	73	73	0.0	0.0	0.0
5	27	27	27	73	73	73	0.0	0.0	0.0
6	30	30	30	70	70	70	0.0	0.0	0.0
7	37	37	37	60	63	63	3.7	5.3	0.0
8	37	37	37	57	63	63	7.4	10.5	0.0
9	47	50	50	37	50	50	18.5	31.2	0.0
10	47	50	50	33	50	50	22.2	37.5	0.0
11	50	57	57	20	40	43	33.3	56.2	6.2
12	53	63	63	10	30	37	40.7	68.8	12.5
13	57	67	73	3	17	27	44.4	75.0	31.2

Table 18-209

Results of Skin Painting with Crude (Raw) Wash Oil (17-125)

Months of Painting	Percentage Mortality			Percentage Survival			Smith	Horton	
	Non-tumor	Papil-loma	Cancer	Non-tumor	Papil-loma	Cancer	T.I.	T.I.	C.I.
1	13	13	13	87	87	87	0.0	0.0	0.0
2	17	17	17	83	83	83	0.0	0.0	0.0
3	17	17	17	83	83	83	0.0	0.0	0.0
4	20	20	20	80	80	80	0.0	0.0	0.0
5	30	30	30	70	70	70	0.0	0.0	0.0
6	47	47	47	53	53	53	0.0	0.0	0.0
7	50	50	50	47	50	50	4.0	6.7	0.0
8	50	50	50	47	50	50	4.0	6.7	0.0
9	57	57	57	37	43	43	8.0	15.4	0.0
10	60	60	60	30	36	40	12.0	23.1	7.7
11	67	67	67	23	27	33	12.0	23.1	15.4
12	70	70	73	10	23	27	24.0	46.2	15.4
13	73	73	80	7	17	20	24.0	46.2	23.1

Table 18-210

Results of Skin Painting with Coal Tar Oil (Pasting Oil) (17-126)

Months of Painting	Percentage Mortality			Percentage Survival			Smith	Horton	
	Non-tumor	Papil-loma	Cancer	Non-tumor	Papil-loma	Cancer	T.I.	T.I.	C.I.
1	10	10	10	90	90	90	0.0	0.0	0.0
2	33	33	33	67	67	67	0.0	0.0	0.0
3	50	50	50	50	50	50	0.0	0.0	0.0
4	60	60	60	23	33	40	33.3	41.7	16.7
5	73	80	87	3	7	13	46.7	58.3	33.3
6	73	83	97	0	0	3	53.3	66.7	33.3
7	73	83	97	0	0	3	53.3	66.7	41.7
8	73	83	100	0	0	0	53.3	66.7	41.7

All dead by end of 8th month of painting

Table 18-211

Results of Skin Painting with Tar Residue (#30 Medium Pitch) (17-85)

Months of Painting	Percentage Mortality			Percentage Survival			Smith	Horton	
	Non-tumor	Papil-loma	Cancer	Non-tumor	Papil-loma	Cancer	T.I.	T.I.	C.I.
1	3	3	3	97	97	97	0.0	0.0	0.0
2	17	17	17	83	83	83	0.0	0.0	0.0
3	23	23	23	77	77	77	0.0	0.0	0.0
4	33	33	33	63	67	67	4.3	5.0	0.0
5	33	33	33	63	67	67	4.3	5.0	0.0
6	33	33	33	63	67	67	4.3	5.0	0.0
7	37	37	37	37	60	63	34.8	42.1	4.3
8	37	37	37	27	43	63	47.8	57.9	31.6
9	37	37	37	10	37	63	69.6	84.2	34.8
10	40	40	57	0	23	43	78.2	94.7	57.9
11	40	40	67	0	7	33	78.2	94.7	84.2
12	40	40	83	0	7	17	78.2	94.7	84.2
13	40	40	93	0	0	7	78.2	94.7	94.7

Table 17-212

Results of Skin Painting with HALOWAX 1014 (10-318)

(1 ml. = 0.40 gm. in benzol)

Months of Painting	Percentage Mortality			Percentage Survival			Smith	Horton	
	Non-tumor	Papil-loma	Cancer	Non-tumor	Papil-loma	Cancer	T.I.	T.I.	C.I.
1	21	21	21	79	79	79	0	0	0
2	28	28	28	72	72	72	0	0	0
3	28	28	28	72	72	72	0	0	0
4	31	31	31	69	69	69	0	0	0
5	41	41	41	59	59	59	0	0	0
6	66	66	66	34	34	34	0	0	0
7	69	69	69	31	31	31	0	0	0
8	72	72	72	28	28	28	0	0	0
9	72	72	72	28	28	28	0	0	0
10	76	76	76	24	24	24	0	0	0
11	79	79	79	21	21	21	0	0	0
12	79	79	79	21	21	21	0	0	0

Table 18-213

Results of Skin Painting with Dripolene A and B Sludge (17-163)

Months of Painting	Percentage Mortality			Percentage Survival			Smith	Horton	
	Non-tumor	Papil-loma	Cancer	Non-tumor	Papil-loma	Cancer	T.I.	T.I.	C.I.
1	0	0	0	100	100	100	0.0	0.0	0.0
2	0	0	0	100	100	100	0.0	0.0	0.0
3	7	7	7	93	93	93	0.0	0.0	0.0
4	10	10	10	90	90	90	0.0	0.0	0.0
5	13	13	13	87	87	87	0.0	0.0	0.0
6	13	13	13	80	87	87	7.1	7.7	0.0
7	13	13	13	77	87	87	10.7	11.5	0.0
8	13	13	13	77	87	87	10.7	11.5	0.0
9	13	13	13	77	87	87	10.7	11.5	0.0
10	13	13	13	77	87	87	10.7	11.5	0.0
11	13	13	13	77	87	87	10.7	11.5	0.0
12	20	20	20	70	80	80	10.7	11.5	0.0
13	23	23	23	67	73	73	10.7	11.5	0.0

Table 18-214

Results of Skin Painting with Methyl Cholanthrene

(1 ml. = 0.002 gm. in benzol)

Months of Painting	Percentage Mortality			Percentage Survival			Smith	Horton	
	Non-tumor	Papil-loma	Cancer	Non-tumor	Papil-loma	Cancer	T.I.	T.I.	C.I.
1	4	4	4	96	96	96	0.0	0.0	0.0
2	4	4	4	93	96	96	4.0	3.8	0.0
3	7	7	7	89	93	93	4.0	4.0	0.0
4	7	7	7	48	93	93	48.0	48.0	0.0
5	11	11	11	18	89	89	76.0	76.0	48.0
6	15	22	22	4	33	78	88.0	88.0	80.0
7	15	22	26	0	4	74	92.0	92.0	84.0
8	15	22	48	0	0	52	92.0	92.0	84.0
9	15	22	74	0	0	26	92.0	92.0	84.0
10	15	22	100	0	0	0	92.0	92.0	84.0

All mice dead by end of 10th month of painting

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Data produced 9 (Month) 18 (Day) 93 (Year) Marcia Cubalino Camera Operator

Place Syracuse (City) New York (State)

AMTEK corp

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