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Industrial **BIO-TEST** *Laboratories, Inc.*

1810 FRONTAGE ROAD
NORTHBROOK, ILLINOIS 60062

EIGHTEEN MONTH STATUS SUMMARY TO

MANUFACTURING CHEMISTS ASSOCIATION

CHRONIC VAPOR INHALATION TOXICITY STUDY WITH
VINYL CHLORIDE (ETHYLENE DERIVED)
IN ALBINO RATS, ALBINO MICE
AND GOLDEN HAMSTERS

MAY 13, 1975

IBT NO. 663-03222

CMA 102272

Industrial **BIO-TEST** *Laboratories, Inc.*

1810 FRONTAGE ROAD
NORTHBROOK, ILLINOIS 60062

May 13, 1975

Mr. Milton Freifeld
Project Manager, Vinyl Chloride Research
Manufacturing Chemists Association
1825 Connecticut Avenue, N.W.
Washington, D. C. 20009

Dear Mr. Freifeld:

Re: IBT No. 663-03222 - Eighteen Month Status Summary
of a Chronic Vapor Inhalation Toxicity Study with Vinyl
Chloride (Ethylene Derived) in Albino Rats, Albino Mice
and Golden Hamsters

We are submitting herewith our laboratory report prepared
in connection with the above study.

Very truly yours,



J. C. Calandra
President

JCC:bp

CMA 102273

EIGHTEEN MONTH STATUS SUMMARY TO
MANUFACTURING CHEMISTS ASSOCIATION

CHRONIC VAPOR INHALATION TOXICITY STUDY WITH
VINYL CHLORIDE (ETHYLENE DERIVED)
IN ALBINO RATS, ALBINO MICE
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MAY 13, 1975

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I. Introduction

A chronic vapor inhalation toxicity study with Vinyl Chloride (Ethylene Derived) was initiated on September 10, 1973, and terminated on September 10, 1974. Animals were then placed on observation. A summary of all data obtained through the eighteenth month is reported herein.

II. Summary

Exposure of mice to Vinyl Chloride was terminated after nine months of testing. At this time all surviving mice were placed under observation for the remainder of the investigation with the exception of the T-III group (2,500 ppm) which was sacrificed during the eleventh month.

Rats and hamsters were exposed to Vinyl Chloride for twelve months before being placed under a non-treated observation period.

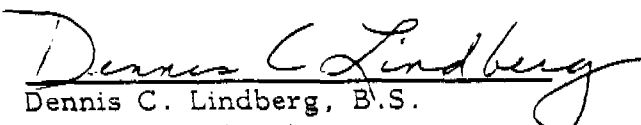
No significant dose related body weight effects were noted among any of the species tested. However, possible mortality effects among high and middle dose level animals have been noted.

Hematologic studies were conducted on a selected number of rats after 18 months with no adverse effects being noted.

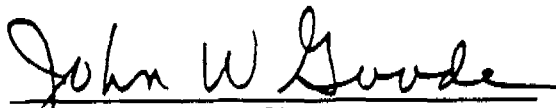
Respectfully submitted,

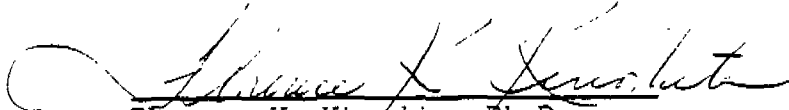
INDUSTRIAL BIO-TEST LABORATORIES, INC.

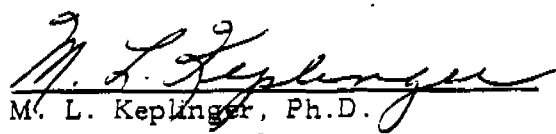
Report prepared by:


Dennis C. Lindberg, B.S.
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Decatur Research Laboratories

Report approved by:


John W. Goode, Ph.D.
Manager
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Toxicology


M. L. Keplinger, Ph.D.
Manager, Toxicology

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III. Chamber Concentration Data

The daily range and mean of the Vinyl Chloride concentrations in each test chamber from exposure number 153 through the end of the twelfth testing month are shown in Table I. Data previous to this were presented in the seven-month status report. The overall average daily vapor concentrations were calculated to be 49.0, 206, 2517 and 2472 ppm for the T-I through T-IV chambers, respectively. Below is a summary of mean values for each sample port in each chamber; T-IV chamber had only one sample port.

	Vapor Concentration (ppm)			
	<u>T-I</u>	<u>T-II</u>	<u>T-III</u>	<u>T-IV</u>
Top	48.5	208	2555	
Middle	48.7	205	2459	2472
Bottom	49.9	205	2538	
Mean	49.0	206	2517	2472

TABLE I

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

Chamber Concentration Data

Day Number	Exposure Number	Chamber Concentration (ppm)											
		T-I			T-II		T-III		T-IV				
		Range		Mean	Range		Mean	Range		Mean	Range		Mean
213	153	45.5	48.5	47.5	176	214	197	1820	2680	2467	2340	2500	2409
214	154	50.5	55.0	51.5	180	242	206	2300	2820	2459	2400	2640	2493
215	155	Holiday, no exposures											
218	156	43.5	53.5	46.5	180	242	202	2180	3000	2554	2140	2380	2231
219	157	46.5	52.5	50.4	154	194	184	2320	2600	2457	2160	2400	2294
220	158	36.5	52.5	45.0	138	250	192	1440	2600	2240	2500	3020	2760
221	159	44.5	55.0	49.2	130	138	134	2460	2620	2540	2600*	*	2600*
222	160	38.6	67.5	45.1	124	260	196	2000	3120	2687	1100	2510	2264
225	161	47.0	61.0	53.1	130	200	179	2380	2920	2384	2500	3000	2664
226	162	47.5	53.0	57.8	150	232	181	2380	2700	2484	2340	2700	2456
227	163	50.0	53.5	51.5	180	210	195	2440	2800	2580	2740	3040	2815
228	164	47.0	53.0	52.1	184	202	187	2200	2660	2488	2600	2900	2669
229	165	46.5	56.0	49.4	190	216	200	2420	2800	2583	2660	2800	2755
232	166	47.0	71.0	52.3	184	228	201	2100	2820	2520	2160	2500	2353
233	167	42.5	53.0	47.9	180	204	199	2300	2740	2479	2480	2940	2667
234	168	38.0	55.5	49.4	180	226	193	2160	2800	2472	2200	2800	2545
235	169	44.0	51.0	47.6	196	215	207	2440	3710	2932	2500	2900	2729
236	170	48.0	56.5	53.6	184	216	205	2120	3100	2528	2460	2980	2668

TABLE I continued

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

Chamber Concentration Data

Day Number	Exposure Number	Chamber Concentration (ppm)											
		T-I			T-II		T-III		T-IV				
		Range		Mean	Range		Mean	Range		Mean	Range		Mean
239	171	46.0	51.5	49.3	186	198	191	2260	2620	2487	2400	2580	2488
240	172	47.0	50.5	48.5	202	214	209	2180	2600	2478	2140	2460	2339
241	173	44.5	55.5	50.4	154	220	197	1500	3340	2468	2340	2760	2532
242	174	46.5	53.0	47.9	180	222	194	2100	2560	2367	2480	2600	2512
243	175	48.5	52.5	50.5	194	206	199	2380	2780	2487	2460	2520	2496
246	176	45.0	54.5	48.8	182	210	198	2320	2760	2534	2320	2660	2536
247	177	47.5	55.0	51.0	-	-	-	2440	2780	2618	2560	2820	2673
248	178	47.5	52.5	51.2	186	222	203	2420	2700	2573	2580	2700	2640
249	179	44.0	56.0	49.4	164	236	201	2560	2740	2645	**	**	**
250	180	Equipment malfunction, no exposures											
253	181	45.5	57.0	51.4	188	218	204	1900	2760	2347	1900	2760	2347
254	182	44.0	51.5	50.0	184	212	193	2320	2500	2396	2420	2500	2464
255	183	43.0	75.0	57.4	88	22	171	2000	2640	2364	2100	2620	2580
256	184	47.0	55.0	50.9	172	230	203	2300	2720	2501	2040	2460	2355
257	185	39.0	57.5	48.0	180	214	199	2140	2400	2328	2280	2500	2380
260	186	35.0	66.0	48.6	182	250	209	2140	2888	2397	2200	2600	2392
261	187	38.0	75.5	49.9	170	266	202	2140	3240	2537	2500	2560	2545
262	188	43.0	50.0	47.4	196	224	205	2160	2560	2400	2460	2560	2524

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TABLE I continued

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

Chamber Concentration Data

Day Number	Exposure Number	Chamber Concentration (ppm)										T-IV Range	Mean
		T-I		T-II		T-III		T-IV					
		Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean		
263	189	Holiday, no exposures											
264	190	41.0	50.5	47.5	192	210	198	2300	2620	2431	**	**	**
267	191	45.5	58.5	50.2	192	251	196	2160	2540	2350	2240	2320	2272
268	192	46.0	57.0	50.5	182	214	200	2320	2620	2452	2380	2440	2400
269	193	41.0	55.5	50.5	186	234	215	2380	2880	2633	2420	2760	2540
270	194	48.0	54.5	50.1	172	214	204	2260	2660	2447	2140	2400	2270
271	195	43.5	50.5	47.3	190	208	200	2140	2560	2439	2380	2500	2408
274	196	44.5	51.0	47.9	188	216	202	2180	2580	2377	2400	2460	2440
275	197	38.0	56.0	49.5	174	242	198	2160	2640	2386	2440	2440	2440
276	198	45.5	52.5	48.9	188	214	199	2320	2720	2457	2340	2740	2564
277	199	47.0	56.0	50.3	170	220	201	2280	2860	2585	2300	2920	2656
278	200	37.0	52.5	48.3	176	226	200	2220	2700	2473	2580	2900	2672
281	201	40.0	56.0	47.5	168	232	204	2360	2740	2515	2520	2720	2600
282	202	43.5	54.0	48.2	176	236	202	2120	2940	2459	2280	2520	2413
283	203	43.0	54.0	49.7	188	216	206	2340	2920	2550	2540	2780	2640
284	204	47.0	57.0	52.5	144	220	194	1400	3420	2620	2210	2600	2478
285	205	43.0	58.5	50.3	154	224	199	2100	2980	2504	2140	2560	2397
288	206	Equipment malfunction, but animals were exposed											

TABLE I continued

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

Chamber Concentration Data

Day Number	Exposure Number	Chamber Concentration (ppm)											
		T-I		T-II		T-III		T-IV					
		Range	Mean	Range	Mean	Range	Mean	Range	Mean				
289	207	42.5	59.0	48.5	194	206	200	2360	2820	2593	2480	2620	2528
290	108	40.0	53.5	45.9	204	218	209	2280	2820	2482	2280	2560	2424
291	209	45.5	51.5	49.3	166	220	203	2380	2680	2521	2440	2560	2516
292	210	Equipment malfunction, no exposure											
295	211	46.5	54.5	47.6	186	230	207	2280	3200	2577	2280	2520	2428
296	212	43.5	53.0	49.3	200	210	205	2480	2660	2613	2520	2680	2585
297	213	Vinyl Chloride gas regulator broken, no exposures											
298	214	Holiday, no exposures											
299	215	Holiday, no exposures											
302	216	Vinyl Chloride gas regulator broken, no exposures											
303	217	Vinyl Chloride gas regulator broken, no exposures											
304	218	45.5	50.5	48.2	202	226	218	2140	2460	2288	2400	2500	2480
305	219	44.5	52.5	48.6	186	210	204	2280	2740	2565	2400	2520	2445
306	220	45.0	57.5	42.3	190	218	203	2360	2660	2481	2400	2500	2440
309	221	41.5	49.5	45.9	168	192	185	2080	2500	2258	2360	2500	2410
310	222	47.5	55.0	51.0	186	196	193	2280	2500	2380	2280	2500	2364
311	223	44.5	57.5	51.3	160	226	184	*	*	2280*	*	*	2440*
312	224	39.0	46.0	42.8	148	172	160	1800	2040	1920	2640	2960	2800

TABLE I continued

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

Chamber Concentration Data

Day Number	Exposure Number	Chamber Concentration (ppm)											
		T-I		T-II		T-III		T-IV					
		Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean		
315	225	37.0	52.5	44.2	146	196	174	1800	2440	2073	2500	3100	2680
316	226	46.0	55.0	54.0	182	220	208	2080	2500	2473	2400	2620	2480
317	227	46.5	55.5	50.6	152	242	205	2040	2800	2558	***	***	***
318	228	46.5	52.0	49.2	170	280	192	1960	2380	2022	2240	2580	2400
319	229	44.5	52.0	49.1	192	222	201	2440	2620	2542	2500	2720	2640
322	230	49.5	56.5	52.0	198	222	210	2500	2680	2699	2300	2620	2460
323	231	49.4	62.0	54.9	176	250	208	2160	2840	2475	2260	2380	2333
324	232	49.5	54.5	50.7	200	208	204	2220	2620	2405	2200	2460	2348
325	233	45.5	56.5	49.7	190	206	196	2400	2840	2597	2220	2500	2370
326	234	48.0	62.0	54.0	170	238	202	2300	2760	2576	2520	2760	2576
329	235	Equipment malfunction, but animals exposed											
330	236	****	****	58.0	200	204	202	2500	2580	2540	***	***	**
331	237	53.5	58.5	55.5	186	198	191	2220	2500	2376	***	***	**
332	238	56.0	56.0	56.0	206	208	208	2260	2380	2300	**	**	2420
333	239	47.5	55.0	51.3	185	210	202	2160	2600	2556	1700	2300	2084
336	240	41.0	44.5	42.8	164	182	168	2280	2620	2481	2420	2700	2584
337	241	40.0	48.5	46.0	172	200	184	2500	2860	2685	-	-	-
338	242	43.0	53.5	49.6	168	200	190	1980	2580	2366	2300	2500	2380

TABLE I continued

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

Chamber Concentration Data

Day Number	Exposure Number	Chamber Concentration (ppm)											
		T-I			T-II		T-III		T-IV				
		Range		Mean	Range		Mean	Range		Mean	Range		Mean
339	243	40.0	60.0	48.9	184	234	203	2380	2960	2607	2380	2440	2413
340	244	29.0	53.0	50.7	182	210	199	2300	2560	2420	2380	2500	2428
343	245	46.5	55.0	50.7	198	210	203	2420	2720	2638	2420	2640	2536
344	246	43.5	52.0	47.6	186	204	195	2300	2560	2458	2400	2500	2467
345	247	49.5	51.0	50.0	190	210	203	2140	2620	2525	2420	2480	2436
346	248	48.5	52.5	50.1	194	206	200	2420	2580	2528	2400	2460	2435
347	249	49.0	53.0	50.8	194	200	197	2240	2520	2422	2320	2460	2375
350	250	-	-	-	180	250	213	2700	2940	2800	2180	2280	2240
351	251	35.0	45.5	39.5	180	246	228	2640	2900	2783	2100	2260	2176
352	252	34.5	64.0	44.3	216	228	219	2560	2820	2680	2280	2500	2395
353	253	54.5	70.0	59.0	206	214	207	2340	2560	2490	2280	2480	2372
354	254	53.0	70.0	58.7	192	202	199	2330	2940	2635	2420	2500	2447
357	255	Holiday, no exposures											
358	256	21.5	54.0	43.5	214	240	225	2420	2800	2654	2420	2500	2460
359	257	46.0	71.0	56.0	202	208	206	2420	2560	2487	2320	2380	2350
360	258	44.5	59.5	50.7	170	216	202	2360	2840	2602	2460	2640	2512
361	259	44.5	54.0	49.7	202	212	206	2340	2600	2480	2380	2460	2440
364	260	40.0	53.0	46.8	196	212	204	2300	2800	2597	2560	2860	2730
365	261	46.5	55.0	51.6	190	200	197	2620	2840	2718	2440	2540	2484

- no exposure

* only 1 sample taken

** no sample taken

*** equipment failure, no exposure

**** equipment failure, animals exposed

IV. Body Weight Data

The mean body weight data for albino rats, albino mice and hamsters are presented in Tables II, III and IV, respectively.

TABLE II

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

Summary of Mean Body Weights - Albino Rats

		Mean Body Weights (grams)																			
		Month Number.																			
Sex	Group	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Change
Male	UC	205	363	456	498	517	537	543	550	559	697	677	689	692	708	739	769	782	779	783	578
	T-I	209	346	448	491	526	545	554	567	593	651	640	670	696	704	732	754	765	773	784	575
	T-II	201	360	457	490	522	549	567	565	585	681	663	696	736	740	764	786	795	781	781	580
	T-III	200	351	453	499	529	500	567	576	581	627	629	680	718	729	764	768	758	-	-	-
Female	UC	160	235	275	299	315	320	326	344	356	392	366	380	398	397	424	444	463	475	491	331
	T-I	168	232	274	297	310	308	323	348	367	357	363	374	384	395	425	448	458	457	472	304
	T-II	171	242	289	302	313	316	329	342	358	368	362	386	393	414	441	479	462	440	450	279
	T-III	165	240	287	303	312	321	329	346	359	359	356	374	378	420	450	-	-	-	-	-
	T-IV	181	251	282	288	291	314	324	338	348	363	363	384	NA	395	NA	393	421	-	-	-

- = No more animals remaining in group.

NA = Not available.

TABLE III

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

Summary of Mean Body Weights - Albino Mice

		Mean Body Weights (grams)																			
		Month Number:																			
Sex	Group	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Change
Male	U.C.	35	40	41	43	46	43	46	52	49	47	43	47	48	47	45	46	44	43	43	8
	T-I	33	39	39	43	44	42	47	45	47	47	48	48	49	48	48	50	48	-	-	-
	T-II	36	40	38	42	44	42	45	43	44	46	37	44	45	-	-	-	-	-	-	-
	T-III	36	38	40	43	44	38	45	41	41	43	31	-	-	-	-	-	-	-	-	-
Female	UC	29	32	33	35	36	35	38	37	41	40	37	40	40	40	41	42	40	40	39	10
	T-I	30	34	34	37	39	38	40	41	40	40	42	43	42	43	44	39	38	-	-	-
	T-II	28	31	34	35	37	36	38	36	40	39	30	40	37	38	40	38	38	-	-	-
	T-III	28	31	34	35	36	37	37	34	37	39	27	-	-	-	-	-	-	-	-	-

- = No more animals remaining in group.

TABLE IV

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

Summary of Mean Body Weights - Golden Hamsters

		Mean Body Weights (grams)																			
		Month Number:																			
Sex	Group	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Change
Male	UC	73	98	110	120	129	130	1331	130	138	141	129	126	125	131	128	125	126	133	138	65
	T-I	71	90	101	114	120	121	122	128	126	118	115	110	115	121	124	122	125	132	132	61
	T-II	63	89	94	99	119	108	120	118	122	117	115	115	121	126	13	129	130	133	134	71
	T-III	60	87	91	93	91	88	112	110	115	115	115111	114	110	123	120	124	129	130	127	67
Female	UC	77	104	108	118	120	121	124	125	128	133	119	116	117	115	122	119	115	120	118	41
	T-I	78	95	102	112	118	118	122	130	126	125	118	110	110	115	117	121	122	125	124	46
	T-II	74	94	99	108	107	106	114	112	116	118	112	112	109	114	116	117	122	126	122	48
	T-III	69	92	100	106	106	104	110	118	105	107	103	99	101	105	109	112	96	-	-	-

- = No more animals remaining in group.

V. Mortality Data

The cumulative monthly mortality data are presented in Tables V through VII.

Marked increases in mortality were noted after the ninth month in both T-III male and female rats. The T-IV group which is composed of only females, and the females in the T-II group showed increases in mortality after the tenth month.

Effects in mortality rates were also observed in mice. Mortality in all three test groups of mice were significantly higher than that of the control group. This phenomenon became apparent among females following the seventh test month, and was noted among males during the ninth month.

A significant increase in mortality was noted among T-III male and female hamsters during the twelfth month of testing.

TABLE V

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats,
Albino Mice and Golden Hamsters

Summary of Mortality Data - Albino Rats

Month Number	Cumulative Number of Mortalities at End of Month								
	UC	T-I		T-II		T-III		T-IV	
	M	F	M	F	M	F	M	F	F
1	0	0	0	0	0	0	0	0	0
2	0	0	2	0	1	0	0	0	0
3	0	1	2	0	1	0	0	4	0
4	0	2	4	11	3	0	1	4	0
5	2	3	5	1	6	1	3	4	0
6	3	4	6	1	6	1	5	4	0
7	4	4	8	2	6	2	6	5	0
8	4	5	9	3	10	5	10	8	1
9	4	6	10	4	11	5	16	15	4
10	5	7	11	7	12	9	24	28	7
11	7	8	13	9	14	19	34	52	17
12*	13	14	19	16	21	37	58	66	40
13	16	17	23	24	26	50	73	83	46
14	19	21	26	30	33	63	85	86	76
15	21	23	28	37	40	75	94	89	86
16	23	25	31	45	46	87	100 (4)	100	100 (7)
17	28	27	35	53	55	90	100	100	100
18	33	28	38	59	64	94	100	100	100

* Includes 5 males and 5 females from each group excluding T-IV sacrificed for cytogenic study.

() Indicates moribund or sick animals sacrificed.

TABLE VI

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats,
Albino Mice and Golden Hamsters

Summary of Mortality Data - Albino Mice

Month Number	Cumulative Number of Mortalities at End of Month							
	UC		T-I		T-II		T-III	
	M	F	M	F	M	F	M	F
1	0	0	0	0	0	0	0	0
2	0	0	0	3	0	0	0	0
3	2	0	6	4	3	0	1	0
4	5	1	19	5	4	1	4	7
5	8	2	26	6	4	2	8	7
6	12	2	30	6	8	3	10	9
7	18	5	31	11	9	12	13	23
8	18	5	32	14	16	30	30	46
9	23	8	38	24	37	58	56	75
10	28	10	42	31	78	82	76	98
11	30	15	54	46	96	94	100	100
12	34	16	57	66	98	95	100	100
13	44	23	70	80	99	97	100	100
14	54	28	79	91	100	100	100	100
15	67	39	88	97	100	100	100	100
16	82	46	100	100	100	100	100	100
17	82	54	100	100	100	100	100	100
18	82	58	100	100	100	100	100	100

TABLE VII

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats,
Albino Mice and Golden Hamsters

Summary of Mortality Data - Golden Hamsters

Month Number	Cumulative Number of Mortalities at End of Month							
	UC		T-I		T-II		T-III	
	M	F	M	F	M	F	M	F
1	5	4	4	4	7	5	2	5
2	8	11	10	12	9	16	10	11
3	8	13	12	14	12	18	14	13
4	9	15	16	16	15	19	15	13
5	9	18	16	16	16	20	15	15
6	13	18	16	16	20	21	16	16
7	13	28	24	19	22	33	18	26
8	14	28	24	19	23	35	19	28
9	14	29	24	20	25	36	20	28
10	14	30	26	20	26	37	23	29
11	15	31	28	21	26	38	28	36
12	18	36	34	33	37	46	40	45
13	23	40	43	49	46	49	49	58
14	28	46	49	58	54	53	61	69
15	39	61	53	72	66	55	71	84
16	50	78	58	83	74	59	84	100 (3)
17	57	81	61	85	76	66	86	100
18	62	85	62	86	77	75	88	100

() Indicates moribund or sick animals sacrificed.

VI. Hematologic Studies

The results of hematologic studies done on male and female rats from the control group and from treatment groups I and II are presented in Tables VIII and IX.

Mean values for total leukocyte and erythrocyte counts, hemoglobin concentration and hematocrit of male and female rats in treatment groups I and II were normal when these values were compared to those of their respective control groups after 18 months of treatment.

Differential leukocyte counts were done on individual animals that had high total leukocyte counts, as follows: 3 male control rats, 4 male rats in T-I, one female rat in T-I and one male rat in T-II. These data are presented in Table X.

TABLE VIII

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

18-Month Hematologic Data - Male Albino Rats

Group	Animal Number	Total Leukocyte Count (thousands/mm ³)	Erythrocyte Count (millions/mm ³)	Hemoglobin Concentration (g/100 ml)	Hematocrit Value (%)
Untreated Control	1	11.4	8.78	14.8	47
	2	19.2*	8.25	15.6	50
	4	9.6	8.55	15.0	48
	5	9.3	9.30	15.4	50
	7	9.4	9.01	14.8	48
	10	88.2	7.36	13.7	46
	11	10.7	7.73	14.6	47
	13	11.8	6.29	11.4	38
	15	8.5	8.12	15.9	50
	16	7.8	8.95	15.6	52
	17	8.9	8.91	17.0	54
	18	11.6	8.93	15.5	51
	19	24.6*	7.84	13.8	45
	20	18.7*	8.13	13.2	44
	21	8.4	8.12	14.4	50
	Mean	11.9	8.28	14.7	48

TABLE VIII continued

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

18-Month Hematologic Data - Male Albino Rats

Group	Animal Number	Total Leukocyte Count (thousands/mm ³)	Erythrocyte Count (millions/mm ³)	Hemoglobin Concentration (g/100 ml)	Hematocrit Value (%)
T-1	201	11.9	8.20	14.2	47
	204	23.3*	8.11	14.4	48
	206	16.6*	8.86	14.6	48
	207	11.7	7.52	13.9	46
	208	28.2*	6.73	12.6	40
	209	8.6	8.51	15.0	49
	212	11.3	8.31	16.1	52
	213	8.9	8.52	14.6	49
	214	11.0	8.12	14.2	46
	216	12.8	8.27	14.7	48
	217	24.4*	8.38	14.6	48
	218	13.5	7.83	14.7	49
	222	9.0	7.99	14.6	46
	224	13.2	9.62	15.7	52
	233	9.4	8.29	15.0	49
	Mean	14.2	8.22	14.6	48

TABLE VIII continued

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

18-Month Hematologic Data - Male Albino Rats

Group	Animal Number	Total Leukocyte Count (thousands/mm ³)	Erythrocyte Count (millions/mm ³)	Hemoglobin Concentration (g/100 ml)	Hematocrit Value (%)
T-II	403	14.0	7.23	12.1	40
	408	10.6	5.30	11.0	41
	412	10.9	7.87	14.7	47
	413	12.9	8.30	14.0	44
	416	14.4	5.86	9.7	34
	418	12.9	7.52	13.8	44
	419	12.2	7.84	13.9	44
	421	11.4	7.22	13.9	46
	425	15.0	9.56	17.7	55
	428	9.3	8.30	14.6	48
	429	30.4*	8.22	9.7	40
	430	9.5	8.90	14.5	46
	434	8.1	7.98	13.4	44
	435	10.4	8.82	15.3	50
	436	14.0	9.10	14.9	50
	Mean	13.1	7.87	13.5	45

* Differential leukocyte counts were performed on these animals.

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TABLE IX

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

18-Month Hematologic Data - Female Albino Rats

Group	Animal Number	Total Leukocyte Count (thousands/mm ³)	Erythrocyte Count (millions/mm ³)	Hemoglobin Concentration (g/100 ml)	Hematocrit Value (%)
Untreated Control	102	9.1	7.26	14.7	46
	103	8.0	7.02	13.4	44
	104	9.1	5.90	11.5	40
	105	9.4	7.71	14.2	46
	107	7.8	7.59	14.2	46
	108	14.6	7.05	14.7	48
	110	6.0	6.58	13.0	42
	111	5.8	6.36	13.0	42
	112	6.5	7.04	14.0	44
	113	6.3	7.26	14.1	46
	114	9.8	6.80	14.0	46
	115	5.2	6.72	14.0	46
	117	4.2	7.35	14.6	47
	118	5.3	6.68	13.8	45
	119	6.5	7.27	14.6	46
	Mean	7.6	6.97	13.8	45

TABLE IX continued

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

18-Month Hematologic Data - Female Albino Rats

Group	Animal Number	Total Leukocyte Count (thousands/mm ³)	Erythrocyte Count (millions/mm ³)	Hemoglobin Concentration (g/100 ml)	Hematocrit Value (%)
T-I	304	3.0	7.17	13.4	44
	305	12.7	6.16	13.6	44
	309	6.9	7.11	14.4	48
	310	12.9	6.38	12.4	42
	312	13.2	7.16	13.6	48
	315	7.7	6.98	13.3	44
	317	6.0	6.23	11.9	38
	322	8.3	7.23	13.7	45
	323	5.6	7.30	14.3	46
	324	7.2	7.40	13.3	43
	326	7.9	6.79	13.2	44
	327	7.1	7.08	13.2	44
	329	8.8	7.12	12.6	43
	331	16.0*	4.50	9.0	33
	332	7.4	5.89	11.2	36
	Mean	8.7	6.70	12.9	43

TABLE IX continued

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

18-Month Hematologic Data - Female Albino Rats

Group	Animal Number	Total Leukocyte Count (thousands/mm ³)	Erythrocyte Count (millions/mm ³)	Hemoglobin Concentration (g/100 ml)	Hematocrit Value (%)
T-II	511	7.6	6.60	12.0	40
	514	7.8	7.20	13.7	43
	522	4.8	6.22	11.7	40
	557	5.3	7.24	13.4	44
	566	7.5	6.44	12.6	42
	580	11.1	6.85	13.2	43
	Mean	7.4	6.76	12.8	42

TABLE X

TEST MATERIAL: Vinyl Chloride (Ethylene Derived)

Chronic Vapor Inhalation Toxicity Study - Albino Rats, Albino Mice and Golden Hamsters

18-Month Hematologic Data - Albino Rats

Group	Animal Number and Sex	Differential Leukocyte Count (Number of Cells per Hundred)				
		Neutrophils (%)	Lymphocytes (%)	Monocytes (%)	Eosinophils (%)	Basophils (%)
Untreated Control	2-M	45	54	0	1	0
	19-M	42	58	0	0	0
	20-M	44	52	3	1	0
T-I	204-M	22	78	0	0	0
	206-M	20	78	0	2	0
	208-M	35	64	1	0	0
	217-M	39	59	0	2	0
T-II	429-M	26	73	0	1	0
T-I	331-F	61	39	0	0	0