



DOW CHEMICAL U.S.A.

REV
8(E)

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HEX-EXCURSION SAMPLES

Introduction:

This report describes the results of excursion samples taken within the Solvents plant for the detection of hexachloroethane (HCE) hexachlorobutadiene (HCBD), and hexachlorobenzene (HCBZ).

Procedure:

Sipin personal sampler pumps were either worn by employees as they performed specific jobs or placed in certain areas of the plant. The samplers were each attached to a 4 inch X 0.25 inch glass tube packed with porapak Q chromatographic column packing and were all calibrated to operate at 75 cc/minute flow. For the specified sampling period the pump sampled on a continuous basis the air personnel were exposed to or present in the various sample points. The porapak Q packing was then extracted with pesticide grade hexane and analyzed for the hexachlorinated compound via electron capture detection gas chromatography. PPB by volume concentration levels were determined by the following equation:

$$\text{ppb(v) Hex cmpd} = \frac{(\text{ug hex cmpd}) \text{ RT X } 10^6}{(\text{MW}) (\text{P}) (\text{L})}$$

where:

R = 0.08251 l/atm/^oK ; T = ^oK
ug = micrograms of hex compound detected
P = 1 atm or 760 mm Hg

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Results:

Table I shows the results of personnel excursions for specific duties performed by the employee within a particular job classification. Exposures to hexachlorobutadiene were above the TLV of 10 ppb for all of these jobs.

Table II shows the results of aerial excursions. Again in most cases the concentration levels for hexachlorobutadiene were high and above the TLV.

Table III shows a comparison of aerial excursions taken while the thermal oxidizer burned hexes with those taken when no hexes were burned. Samples collected for the former showed higher concentrations for all three hex compounds.

Summary/Conclusion:

Hexachlorinated compounds were detected in both personnel and aerial excursion samples in moderate amounts. While exposure to hexachloroethane and hexachlorobenzene were well within the respective TLV's for all samples, the exposure in most cases to hexachlorobutadiene were relatively high and above the TLV limits.

Monitoring of these jobs and other related ones should be continued on a regular basis.



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TABLE I
(Personnel Hex Excursions) *

<u>Employee</u>	<u>Job Classification</u>	<u>Sampling Date</u>	<u>Sampling Time, hrs.</u>	<u>Liter Air</u>	<u>HCE</u>	<u>HCBD</u>	<u>HCBZ</u>	<u>Activity</u>
/ C. Arceneaux	OTT EDO	10/5/77	0.75	7.6	464.6	488.9	12.4	Repaired C-5B reflux pump- <u>Pulled only.</u>
/ R. Vaughn	SOT Per/Tet	10/7/77	8.0	50.0	36.7	39.4	10.0	Repaired leaks on E-12
/ D. LeCouq	SOT Per/Tet	10/10/77	6.0	26.0	48.2	65.5	42.6	Small leak under D-2C/routine
/ Q. Skidmore	Janitor	10/7/77	8.0	22.9	195.9	218.1	26.3	Worked in hex area
W. Hines	Janitor	10/7/77	8.0	30.0	125.5	111.0	16.2	" " " "
W. Hines	"	10/14/77	8.0	35.4	367.5	72.3	1.12	Shoveled hexes out of ditch by green tank/cleaned hexes off lines on D-13
W. Hines	"	10/17/77	1.0	4.3	94.6	66.9	4.6	Hosing up hexes & organics spilled on ground during R-1C shutdown
W. Hines	"	10/18/77	2.75	6.6	260.2	160.8	4.7	Cleaned up hex area
W. Hines	"	10/19/77	2.0	4.9	15.2	10.9	0.5	Worked around D-13 on hosing-up hexes
W. Hines	"	10/19/77	2.0	5.2	14.7	22.7	0.6	Cleaned hexes around D-12 & hosed area

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TABLE I - continued -

<u>Employee</u>	<u>Job Classification</u>	<u>Date</u>	<u>Time, hrs.</u>	<u>Liters</u>	<u>HCE</u>	<u>HCBD</u>	<u>HCBZ</u>	<u>Activity</u>
/ C. Arceneaux	OTT EDO	10/20/77	0.3	2.7	12.5	19.3	1.3	Pulled P-34B which is the pump on D-13 and steamed out
/ L. Sam	OT EDO	10/20 77	0.3	2.7	18.4	33.4	1.7	Observed Charles as he pulled pump above stood downwind of the activity - wind out of NE at 8 mph
Taylor	Dow Industrial Service (DIS)	10/17/77	1.0	9.5	29.2	25.5	1.6	Worked as rodder on D-2C reboiler
Demsey	Dow Industrial Service (DIS)	10/17/77	1.0	8.4	7.4	9.9	3.0	Worked the foot control pedal for Taylor as he rodDED D-2C reboiler - stood about 15' away from the job

TABLE II
(Hex Aerial Excursions)*

<u>Sample Location</u>	<u>Sampling Date</u>	<u>Sampling Time, hrs.</u>	<u>Liters Air</u>	<u>HCE</u>	<u>HCBD</u>	<u>HCBZ</u>	<u>Comments</u>
Downwind of F-4 stack	10/10/77	4.0	12.6	66.9	264.6	60.7	Hexes burning
Control room	10/17/77	3.25	13.9	14.3	10.7	0.73	Operators traveling in and out from R-1C which shutdown and was being washed out
Control room	10/18/77	8.0	34.9	1.8	2.9	0.62	Wind out of North @ 2 mph
Control room	10/19/77	8.0	34.7	1.7	2.8	0.47	Wind out of SW @ 2 mph
Base of C-60	10/17/77	3.25	15.0	83.3	34.5	0.68	Some hexes on the ground in the area - F-4 not burning hexes
Base of R-51	10/17/77	3.25	13.4	3.3	9.3	1.9	Downwind of F-4/ wind out of the North at 2 mph
Base of R-1	10/18/77	8.0	31.8	5.3	14.5	0.62	Wind out of North @ 2 mph
Base of BRU	10/19/77	8.0	28.1	26.5	14.2	0.54	Downwind of hex area - wind out of SW at 2 mph
East of D-15	10/19/77	8.0	35.0	14.9	12.0	0.53	Downwind of hex area - wind out of SW at 2 mph

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TABLE III
(Hex Excursion Samples)*

<u>Sample Location</u>	<u>Sampling Date</u>	<u>Sampling Time, hrs.</u>	<u>Liters Air</u>	<u>HCE</u>	<u>HCBD</u>	<u>HCBZ</u>	<u>Comments</u>
Ditch by C-32 drain	10/6/77	4.0	17.5	1.4	1.0	0.03	Not burning hexes
Ditch by C-32 drain	10/10/77	4.0	12.3	48.2	65.5	42.6	F-4 burning hexes
Ditch at west corner of 123 unit	10/6/77	4.0	17.7	5.2	10.0	0.1	Not burning hexes
Ditch at west corner of 123 unit	10/10/77	4.0	13.5	52.9	86.8	5.1	F-4 burning hexes
Ditch by Don Rouse's office	10/6/77	4.0	15.8	7.8	15.3	0.13	Not burning hexes
Ditch by Don Rouse's office	10/10/77	4.0	13.5	6.8	8.1	43.5	F-4 burning hexes

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Hef Excursion Samples

Table I

<u>Tube #</u>	<u>Sampling Date</u>	<u>Sample Location</u>	<u>Sampling Time (hr)</u>	<u>Liters Air</u>	<u>HCE</u>	<u>HCBd</u>	<u>HCBz</u>	<u>Comment</u>
6	9-27-77	R. Vaugh	.25	1.2	9.4	11.3	0.20	Feeding hebes Chang rotunder on D-67C
9	9-27-77	S. Miller	.75	3.6	3.3	25.8	0.50	Making Hef. Stds
22	10-6-77	Ditch by C-32 drain	4.0	17.5	1.4	1.0	0.03	Not burning hebes at time
23	10-6-77	Ditch at ^{west} corner of T23 area	4.0	17.7	5.2	10.0	0.10	"
24	10-6-77	Ditch by Sm Rosa's Office	4.0	15.8	7.8	15.3	0.13	"

Note: Samples 22, 23, and 24 imply that
hebes increase as you move away
from the burner — are hebes lost
from smoke stack?

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