PLAINTIFF'S
EXHIBIT
CEL-602

CELANESE CHEMICAL COMPANY
TECHNICAL CENTER
Corpus Christi, Texas

ESR-308-77 Ramey

Environmental Health at
the Tech Center
Air Monitoring

Bay City
Ms. J. L. White

Bishop
Ms. A. Retherford

Houston
Mr. E. Green

New York
Mr. J. M. Ramey

Pampa
Mr. M. Stenzel

CCCTC
Dr. B. J. Bland
Dr. R. F. Stubbeman
Dr. L. Starr
Mr. W. E. Heinz
Mr. R. D. Damron
Mr. J. P. Hawthorne

563

Uniterms

Air Monitoring
OSHA
TLV

GEN 55 (REV.6/74)

Interoffice Memorandum

TO (Name and Location)	DATE
Mr. R. M. Guedin - CCCTC	January 7, 1977
FROM (Name and Location)	REFERENCE NO.
E. S. Ramey - CCCTC	ESR-308-77

Environmental Health at the Tech Center
Air Monitoring

A proposed survey of chemicals and locations (ESR-305-76) for which air monitoring may be needed was submitted to the Tech Center OSHA Committee for their approval. The format of the report was as requested. The report has been accepted by the OSHA Committee.

At the request of our OSHA Committee priorities were assigned for the chemicals listed in the survey. These were reported to the Committee (ESR-307-76).

The Tech Center Ventilation Survey has been contracted. Air flow measurements by the contractor are nearly complete. The report of this work is due about January 15, 1977. This data will be used as a base case data for chemical air contamination calculations, the repair of faulty systems found, and reference for future air flow measurements.

All Tech Center air monitoring continues to be by request of management or supervision. Air monitoring for benzene in the specialty acrylate unit (on the slab) and formaldehyde in labs 102 and 286 have been made since the last summary report (ESR-301-76).

Benzene has been in use in the specialty acrylate unit (SAU) on the slab. This unit has been operating in the batch mode during November and December.

Continuous exposure to benzene for full work shifts is not present due to the batch type operation of the unit. At certain steps in the process of esterification and purification, exposure to benzene at levels above 1 ppm is possible. These include:

1. Loading of solids (such as TMP) into the unit reactor.
2. Dumping of reaction water after removal and weighing.
3. Dumping of the water phase from the carbonate treatment.
4. Dumping of the water phase from caustic treatment.
5. Clean up of the filtering system after use.
6. Preparation of the reactor vessel for the next batch run.

008415

Work times for these range from less than fifteen minutes to about one hour.

Breathing zone air of the unit operators during most of these periods has been monitored (using charcoal tubes) and analyzed. No benzene exposure obove the action level (5 ppm) has been found in the samples analyzed. A summary of this data is given in Table I. The highest level of breathing zone air measured to date was 1.7 ppm benzene for a job which lasted only 10 minutes.

Additional monitoring during these worst case exposure times has been started using the HNU Photoionization Meter. This instrument has been on loan to the Pampa Plant Health Chemist for use in the areas of possible benzene exposure. It was found to be very useful at the Pampa Plant. They will recommend purchase of the instrument for the Pampa Plant.

Formaldehyde concentration in the breathing zone air at the face of the hoods in Labs 102 and 286 has been measured (see Table I). With the hood door open levels of <2 ppm were found at the work stations. Drager detector tubes (CH 264) were used for this work. During operation of the reaction apparatus inside the hoods, the hood door remains closed except for time periods required to maintain or repair the equipment.

Air monitoring for methacrolein in the process analyzer room (113) of lab 113 and methanol, formaldehyde, and HF around the methanol oxidation unit of lab 324 is scheduled for January.

Reports containing Environmental Health Data are given in Table II.

E. S. Ramey

ESR:eem

008416

TABLE I

INDUSTRIAL HEALTH MONTHLY MONITORING SUMMARY

1. Federal Register, Vol. 39, No. 125, pp 23541-43.
2. Not established, N. E.
3. Molybdenum as soluble compounds.
4. Magnesium as MgO.
5. Iron as Fe_2O_3.
6. Soluble salts as Fe_2O_3.
7. Reference ESR-288-76.
8. Asbestos measured as fibers/cc of air analysis by National Loss Control Service Corp., Long Grove, Illinois.
9. Asbestos Permissable Exposure Level was lowered to 2 fibers/cc air effective July 1, 1976.
10. Not 8 hour TWA.
11. NO_x measured as NO_2.
12. Drager Tube, NIOSH approved.
13. Method not quantitative, for identification.

008417

TABLE II

ENVIRONMENTAL HEALTH REPORTS

Date	Letter No.	Description
10/8/76	ESR-302	Bishop Celcon Process Vent Samples
10/27/76	ESR-303	Method for Nickel Carbonyl
11/2/76	ESR-304	Drager Detector Tube Seminar
11/8/76	ESR-305	Proposed Air Monitoring for the Tech Center
11/15/76	ESR-306	Mass Spectrometer Analysis of Bishop T-206 Overhead Vent
12/3/76	ESR-307	Chemical Health Hazard Priority List for the Tech Center



INDUSTRIAL HEALTH MONTHLY MONITORING SUMMARY

Sequence No. (Where Applicable)	Date	Unit	Employee Name (Social Security Number)	Job Description	Contaminant Monitored	Monitoring Method	8-Hour TWA Exposure Mg/M³	Acceptable TWA(1) Mg/M³	Ceiling Level Mg/M³ (Duration in Minutes)(1)	Highest Concentration Detected Mg/M³	Comments
1-76	15 JAN 76	LAB 114	W.H. REISS 450-20-9520	SR. LAB TECH	RESPIRABLE PARTICULATE	FILTER WITH CYCLONE SEPARATOR	0.2	5	N.E. (2)	0.2	GRAVIMETRIC CAHN E. BALANCE
008419					CHROMIUM	P&CAM 173	<.005	0.5	~~N.E.~~	<.005	ANALYSIS BY A.A. (NIOSH)
					COBALT	"	<.001	0.1	N.E.	<.001	
					MOLYBDENUM (3)	"	<.001	5 (3)	N.E.	<.001	
					MAGNESIUM (4)	"	<.01	10	N.E.	<.01	
					IRON (5)	"	<.01	10 (6)	N.E.	<.01	
					ANTIMONY	"	<.001	0.5	N.E.	<.001	
					BISMUTH	CALCULATION (7)	<.001	NOT LISTED	N.E.	<.001	
					CESIUM	"	<.001	"	N.E.	<.001	
					PHOSPHORUS	"	<.001	0.1	N.E.	<.001	
2-76	19 JAN 76	LAB 114	C.H. McKINNEY 454-68-6779	SR. LAB TECH	ASBESTOS	NIOSH METHOD	<0.1 FIBER (8)	5 FIBERS (9) c.c. AIR		<0.1 FIBER	ESR-284-76
3-76	26 JAN 76	LAB 114	B.D. DOGGETT 464-58-3902	SR. LAB TECH	ASBESTOS	NIOSH METHOD	<0.1 FIBER (8)	5 FIBERS (9) c.c. AIR		<0.1 FIBER	ESR-284-76
4-76	27 JAN 76	LAB 114	W.H. REISS 450-20-9520	SR. LAB TECH	ASBESTOS	NIOSH METHOD	<0.1 FIBER (8)	5 FIBERS (9) c.c. AIR		<0.1 FIBER	ESR-284-76
5-76	29 JAN 76	LAB 114	CEILING LIMIT SAMPLE	—	ASBESTOS	NIOSH METHOD	<0.1 FIBER (8)	5 FIBERS (9) c.c. AIR		<0.1 FIBER	ESR-284-76

INDUSTRIAL HEALTH MONTHLY MONITORING SUMMARY

Sequence No. (Where Applicable)	Date	Unit	Employee Name (Social Security Number)	Job Description	Contaminant Monitored	Monitoring Method	8-Hour TWA Exposure Mg/M3	Acceptable TWA(1) Mg/M3	Ceiling Level Mg/M3 (Duration in Minutes)(1)	Highest Concentration Detected Mg/M3	Comments
6-76	2 FEB 76	LAB 114	W.H. REISS 450-20-9520	SR. LAB TECH	RESPIRABLE PARTICULATE	FILTER WITH CYCLONE	0.1	5	N.E.	0.1	GRAVIMETRIC CAHN E. BAL.
					CHROMIUM	P&CAM 173	<.005	0.5	N.E.	<.005	ANALYSIS BY A.A. (NIOSH)
					COBALT	"	<.001	0.1	N.E.	<.001	
					MOLYBDENUM(5)	"	<.001	5(2)	N.E.	<.001	
					MAGNESIUM(4)	"	<.01	10	N.E.	<.01	
					IRON (5)	"	<.1	10(6)	N.E.	<.1	
					ANTIMONY	"	<.001	0.5	N.E.	<.001	
					BISMUTH	CALCULATION(7)	<.001	N.E.	N.E.	<.001	
					CESIUM	"	<.001	N.E.	N.E.	<.001	
					PHOSPHORUS	"	<.001	0.1	N.E.	<.001	
7-76	4 FEB 76	LAB 67	R.D. VALLENN 429-74-3486	ELECTRONICS TECHNICIAN	ASBESTOS	NIOSH METHOD	<0.1 FIBER(8)	5 FIBERS(9) C.C. AIR		<0.1 FIBER	CEILING LIMIT SAMPLE (A)
8-76	10 FEB 76	LAB 114	C.H. MCKINNEY 454-68-6779	SR. LAB TECH	RESPIRABLE PARTICULATE	FILTER WITH CYCLONE	0.2	5	N.E.	0.2	GRAVIMETRIC CAHN E. BAL.
					CHROMIUM	P&CAM 173	<.005	0.5	N.E	<.005	ANALYSIS BY A.A. (NIOSH)
					COBALT	"	<.001	0.1	N.E.	<.001	
					MOLYBDENUM(5)	"	<.001	5(3)	N.E.	<.001	
					MAGNESIUM(4)	"	<.01	10	N.E	<.01	

(A) ADD 2276-15-1

008420

INDUSTRIAL HEALTH MONTHLY MONITORING SUMMARY

Sequence No. (Where Applicable)	Date	Unit	Employee Name (Social Security Number)	Job Description	Contaminant Monitored	Monitoring Method	8-Hour TWA Exposure Mg/M3	Acceptable TWA(1) Mg/M3	Ceiling Level Mg/M3 (Duration in Minutes)(1)	Highest Concentration Detected Mg/M3	Comments
8-76 (CONT)					IRON (5)	P&CAM 173	<.01 (6)	10	N.E.	<.01	ANALYSIS
					ANTIMONY	"	<.001	0.5	N.E.	<.001	BY A.A. (NIOSH)
					BISMUTH	CALCULATION (7)	<.001	N.E.	N.E.	<.001	
					CESIUM	"	<.001	N.E.	N.E.	<.001	
					PHOSPHORUS	"	<.001	0.1	N.E.	<.001	
9-76	13FEB76	LAB 64	J.H. RYLAND 465-60-3921	SR. RES. TECH	MERCURY VAPOR	DRAGER TUBE	<.05 (10)	.05	/ (1)	<.05	22976-18
10-76	24FEB76	LAB 64	J.H. RYLAND 465-60-3921	SR. RES. TECH	MERCURY VAPOR	DRAGER TUBE	<.05 (10)	.05	/ (1)	<.05	22976-21-1
11-76	24FEB76	LAB 318	P.A. DRAKE 466-58-5928	SR. RES. TECH	MERCURY VAPOR	DRAGER TUBE	<.05 (10)	.05	/ (1)	<.05	22976-21-2
12-76	24FEB76	LAB 161	P.A. DRAKE 466-58-5928	SR RES TECH	MERCURY VAPOR	DRAGER TUBE	<.05 (10)	.05	/ (1)	<.05	22976-21-3
13-76	24FEB76	LAB 103	D.W. HARRIS 450-80-6094	CHEMIST	MERCURY VAPOR	DRAGER TUBE	<.05 (10)	.05	/ (1)	<.05	22976-21-4
14-76	27FEB76	LAB 318	P.A. DRAKE 466-58-5928	SR RES TECH	MERCURY VAPOR	DRAGER TUBE	<.05 (10)	.05	/ (1)	<.05	22976-22-1
15-76	27FEB76	LAB 103	D.W. HARRIS 450-80-6094	CHEMIST	MERCURY VAPOR	DRAGER TUBE	<.05 (10)	.05	1 (1)	<.05	22976-22-2

008422

INDUSTRIAL HEALTH MONTHLY MONITORING SUMMARY

PAGE 4

Sequence No. (Where Applicable)	Date	Unit	Employee Name (Social Security Number)	Job Description	Contaminant Monitored	Monitoring Method	8-Hour TWA Exposure Mg/M3	Acceptable TWA(1) Mg/M3	Ceiling Level Mg/M3 (Duration in Minutes)(1)	Highest Concentration Detected Mg/M3	Comments
16-76	27FEB76	LAB 161	P.A. DRAKE 466-58-5928	SR. RES. TECH	MERCURY VAPOR	DRAGER TUBE	<.05(10)	.05	1(1)	<.05	22976-22-3
17-76	1MAR76	BUILDING 107	S.C. HAHN 456-28-8396	INSTRUMENT-MAN	MERCURY VAPOR	DRAGER TUBE	<.05(10)	.05	1(1)	<.05	22976-23-1
18-76	1MAR76	BUILDING 107	E. GALLION 459-44-1414	INSTRUMENT-MAN	MERCURY VAPOR	DRAGER TUBE	<.05(10)	.05	1(1)	<.05	22976-23-2
19-76	1MAR76	BUILDING 107	E.J. PITTERSON 506-03-7906	INSTRUMENT-MAN	MERCURY VAPOR	DRAGER TUBE	<.05(10)	.05	1(1)	<.05	22976-23-3
20-76	1MAR76	BUILDING 107	M.H. WEBB 459-52-8958	INSTRUMENT-MAN	MERCURY VAPOR	DRAGER TUBE	<.05(10)	.05	1(1)	<.05	22976-23-4
21-76	1MAR76	BUILDING 107	MERCURY STORAGE CABINET	—	MERCURY VAPOR	DRAGER TUBE	<.05(10)	.05	1(1)	<.05	22976-23-5
22-76	1MAR76	BUILDING 107	J.E. ENEKS 463-48-0937	INSTRUMENT-MAN	MERCURY VAPOR	DRAGER TUBE	<.05(10)	.05	1(1)	<.05	22976-23-6
23-76	1MAR76	LAB 44	ERIKA CLARK 087-32-6454	LAB TECH	MERCURY VAPOR	DRAGER TUBE	<.05(10)	.05	1(1)	<.05	22976-24-1
24-76	27MAY76	LAB 113	C.A. DALTON 453-24-6886	SR. RES. TECH	NO_x(11)	DRAGER TUBE(12)	<2(10)	9	N.E.	<2	
25-76	16JUNE76	LAB 113	L.R. JOHNSON 473-28-9138	SR RES. TECH	NO_x(11)	DRAGER TUBE(12)	<2(10)	9	N.E.	<2	

008423

INDUSTRIAL HEALTH MONTHLY MONITORING SUMMARY

Sequence No. (Where Applicable)	Date	Unit	Employee Name (Social Security Number)	Job Description	Contaminant Monitored	Monitoring Method	8-Hour TWA Exposure Mg/M³	Acceptable TWA(1) Mg/M³	Ceiling Level Mg/M³ (Duration in Minutes)(1)	Highest Concentration Detected Mg/M³	Comments
26-76	9JUN76	LAB 113	WENDEL JOHNSON 463-82-5775	LAB TECH	NO_2	DRAGER TUBE (12)	<1 (10)	9	N.E	<1	
27-76	16 JULY 76	BUILDING 130, RM 106	DRY ICE CHEST WORK STATION	—	CO	DRAGER TUBE (12)	<5 (10)	55	200	<5	
28-76	19JULY76	LAB 69	YOLANDA MORGAN 451-88-6423	LAB TECH	ASBESTOS	NIOSH	<.3 FIBER (e)	2 FIBERS (9) C.C. AIR		<.3 FIBER	22976-37
29-76	19JULY76	LAB 69	YOLANDA MORGAN 451-88-6423	LAB TECH	PYRIDINE	PI-101 ANALYZER	10 (10)	15	10		CEILING LIMIT SAMPLE
30-76	21JULY76	LAB 77	A.E. RUMME 478-60-2941	LAB TECH	ASBESTOS	NIOSH	0.18 (e) FIBER/CC	2 FIBERS (9) CC AIR		0.18 FIBER/CC	22976-39
31-76	23JULY76	LAB 287	HOOD DUST	—	ASBESTOS	SCOTCH TAPE SEM (13)	ASBESTOS DUST	FIBERS SAMPLE	WERE PRESENT IN		PBD-182-76
32-76	23JULY76	LAB 280	MS. D FIRPI-GARCIA 584-78-5324	LAB TECH	BENZENE	PI-101 ANALYZER	<15	30	60 (10)	30	WORK WAS MOVED INSIDE HOOD
33-76	29JULY76	LAB 62	E.S. RAMEY 458-24-9332	RES. CHEMIST	ASBESTOS	NIOSH	<.1 FIBER (e)	2 FIBERS (9) CC AIR		<.1 FIBER	22976-40

008424

INDUSTRIAL HEALTH MONTHLY MONITORING SUMMARY

Sequence No. (Where Applicable)	Date	Unit	Employee Name (Social Security Number)	Job Description	Contaminant Monitored	Monitoring Method	8-Hour TWA Exposure Mg/M³	Acceptable TWA(1) Mg/M³	Ceiling Level Mg/M³ (Duration in Minutes)(1)	Highest Concentration Detected Mg/M³	Comments
34-76	29JULY76	LAB 114	R. BARRERA 449-92-0430	LAB TECH	ASBESTOS	NIOSH	<.1 FIBER (6)	2 FIBERS (4) cc AIR		<.1 FIBER	22976-41
35-76	30JULY76	LAB 113	WENDER JOHNSON 463-82-5775	LAB TECH	ASBESTOS	NIOSH	<.1 FIBER (6)	2 FIBERS (9) cc AIR		<.1 FIBER	22976-42
36-76	9AUG76	LAB 113	L.R. JOHNSON 473-28-9138	SR LAB TECH	ASBESTOS	NIOSH	1 FIBER (6)	2 FIBERS (9) cc AIR		U0 1 FIBER	CEILING LIMIT SAMPLE 22976-43
37-76	27AUG76	LAB 65	AREA SAMPLE	—	HEXANE	PI-101 ANALYZER	<180 ~~<50ppm~~	1800 ~~ppm~~		200	PI-101 WITH GHR R. CHART
38-76	27AUG76	LAB 283	W.C. FUQUA 519-58-3007	RES. CHEMIST	BENZENE	NIOSH	<3.2	32	160 (10) ~~50~~	<3.2	
39-76	26AUG76	PI-101 LAB 283	ANALYZER ANALYSIS FOR BENZENE FAILED DUE TO SEVERE ACETONE INTERFERENCE								
40-76	1SEPT76	LAB 67	AREA SAMPLE HOOD WORK STATION	—	HYDROGEN CYANIDE	DRAGER TUBE (12)	<2 U0	11	N.E.	<2	HCN HANDLED IN HOOD
41-76	2SEPT76	LAB 104	HOOD WORK STATION	—	HYDROGEN CYANIDE	DRAGER TUBE (12)	<2 (10)	11	N.E.	<2	HCN HANDLED IN HOOD
42-76	2SEPT76	MAINTENANCE RAYLOCK NO ASBESTOS FIBERS		INSULATION	SAMPLE CHECKED FOR ASBESTOS FIBERS BY SEM WERE FOUND						22976-46 PBD-180-76

008425

INDUSTRIAL HEALTH MONTHLY MONITORING SUMMARY

PAGE 7

Sequence No. (Where Applicable)	Date	Unit	Employee Name (Social Security Number)	Job Description	Contaminant Monitored	Monitoring Method	8-Hour TWA Exposure Mg/M3	Acceptable TWA(1) Mg/M3	Ceiling Level Mg/M3 (Duration in Minutes)(1)	Highest Concentration Detected Mg/M3	Comments
43-76	3 SEPT 76	BUILDING 130 ROOM 36	AREA SAMPLE	LEAKING OZALID MACHINE	AMMONIA	DRAGER TUBE (12)	<7 (16)	35	N.E.	<7	
44-76	6 SEPT 76	LAB 280 HOOD	T.H. PAYNE 442-20-2579	SC LAB TECH	HCN	DRAGER TUBE (12)	<2	11	N.E.	<2	HOOD WORK STATION MONITORED
45-76	14 SEPT 76	BUILDING 130 ROOM 56	AREA SAMPLE		PAINT FUMES	PI-101	NOT QUANTITATIVE / MIXTURE. VENTILATION FANS WERE BROUGHT INTO AREA BEING PAINTED				
46-76	12 OCT 76	ANALYSIS ABORTED, CAHN ELECTRO BALANCE MALFUNCTION (REPAIRED 14 OCT 76)									
47-76	~~BEGINNING OF ORIGINAL TAPE 1, OF ESR LETTER 76-DSC-26~~										

008426

TABLE 1

INDUSTRIAL HEALTH MONTHLY MONITORING SUMMARY

Sequence No. (Where Applicable)	Date	Unit	Employee Name (Social Security Number)	Job Description	Contaminant Monitored	Monitoring Method	8-Hour TWA Exposure Mg/M3	Acceptable TWA(1) Mg/M3	Ceiling Level Mg/M3 (Duration in Minutes)(1)	Highest Concentration Detected Mg/M3	Comments
47-76	11Nov76	SAU	GEO. OSBORN 442-24-4911	SAU OPERATOR	BENZENE	CHARCOAL TUBE		32 (10ppm)	160(10) (50ppm/10)	1.2 (0.4ppm)	CEILING LIMIT SAMPLE
48-76	13Nov76	SAU	A.P. DITTLINGER 458-60-4353	SAU OPERATOR	BENZENE	CHARCOAL TUBE		32	160(10)	2.1 (0.7ppm)	CEILING LIMIT SAMPLE
49-76	22Nov76	SAU	A.P. CLARK 463-26-0142	SAU OPERATOR	BENZENE	CHARCOAL TUBE		32	160(10)	0.6 (0.2ppm)	CEILING LIMIT SAMPLE
50-76	22Nov76	SAU	A.P. CLARK 463-26-0142	SAU OPERATOR	BENZENE	CHARCOAL TUBE		32	160(10)	0.15 (<0.1ppm)	CEILING LIMIT SAMPLE
51-76	1DEC76	SAU.	W.J. LILLY 461-44-5939	SAU OPERATOR	BENZENE	CHARCOAL TUBE		32	160(10)	3 (1ppm)	CEILING LIMIT SAMPLE
52-76	1DEC76	SAU	W.J. LILLY	SAU OPERATOR	BENZENE	CHARCOAL TUBE		32	160(10)	5.2 (1.7ppm)	CEILING LIMIT SAMPLE
53-76	14DEC76	LAB 102	AREA SAMPLE	HOOD WORK STATION	FORMALDEHYDE	DRAGER TUBE		3.7 (3ppm)	12.3(30) (10ppm)	< 2.5 (<2ppm)	MEASURED 4 TIMES OVER 2HR PERIOD
54-76	22DEC76	LAB 286	AREA SAMPLE	HOOD WORK STATION	FORMALDEHYDE	DRAGER TUBE		3.7 (3ppm)	12.3(30) (10ppm)	< 2.6 (<2ppm)	MEASURED 4 TIMES OVER 1HR PERIOD

(1) FEDERAL REGISTER, VOL. 39, NO. 125, PP 23541-23543