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SOURCE TEST REPORT
AB2588

PACIFIC ENERGY
6055 EAST WASHINGTON BOULEVARD
COMMERCE, CA 90040

RECEIVED
JUN 12 1 10 PM '91
AIR POLLUTION
CONTROL DISTRICT

UNITS TESTED:

LANDFILL GAS-FIRED INTERNAL COMBUSTION ENGINE
OTAY LANDFILL

TEST DATES:

APRIL 2-5, 1991

ISSUE DATE:

MAY 15, 1991

PARAMETERS MEASURED:

FORMALDEHYDE, HYDROGEN CHLORIDE, TOTAL SULFUR COMPOUNDS,
VINYL CHLORIDE, DICHLOROMETHANE, AND BENZENE EMISSIONS

TESTED BY:

SOUTH COAST ENVIRONMENTAL COMPANY
1915 McKINLEY AVENUE, SUITE E
LA VERNE, CA 91750

REPORT NO: T1265

TESTED BY: Keith Adamson

REVIEWED BY: [illegible]

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I. SELECTED RESULTS

PACIFIC ENERGY
APRIL 2-5, 1991
PROJECT: T1265
UNIT: LANDFILL GAS-FIRED INTERNAL COMBUSTION ENGINES

I. SELECTED RESULTS - OTAY LANDFILL

A. FORMALDEHYDE RESULTS (EXHAUST)

RUN NO.	SAMPLE VOLUME (DSCF)	LB/SCF OF LFG	Revised 9/17/91	TOTAL FORMALDEHYDE (LB/HR)	Revised 9/17/91
1	2.12	1.13E-06	7.89×10^{-6}	3.98E-02	2.78×10^{-1}
2	1.99	8.23E-07	5.76×10^{-6}	2.90E-02	2.03×10^{-1}
3	1.90	1.02E-07	7.17×10^{-6}	3.61E-02	2.53×10^{-1}
	AVERAGE =	9.91E-07	6.94×10^{-6}	AVERAGE = 3.50E-02	0.245 #/hr

B. HYDROGEN CHLORIDE RESULTS

i. EXHAUST EMISSIONS

RUN NO.	SAMPLE VOLUME (DSCF)	LB/SCF OF LFG	TOTAL HCL LB/HR
1	72.92	1.10E-05	3.90E-01
2	67.66	8.74E-06	3.08E-01
3	68.98	8.78E-06	3.10E-01
	AVERAGE =	9.52E-06	3.36E-01

ii. INLET EMISSIONS

RUN NO.	SAMPLE VOLUME (DSCF)	TOTAL HCL LB/HR	TOTAL CL LB/HR
1	28.23	1.25E+00	1.53E-04

I. SELECTED RESULTS - OTAY LANDFILL (CONTINUED)

C. VINYL CHLORIDE RESULTS

i. INLET EMISSIONS

RUN NO.	PPB	LB/HR
1	5270	3.06E-02
2	5340	3.10E-02
3	5420	3.15E-02
	AVERAGE =	3.10E-02

ii. EXHAUST EMISSIONS

RUN NO.	PPB	LB/HR	LB/SCF OF LFG
1	0.00	0.00E+00	0.00E+00
2	0.00	0.00E+00	0.00E+00
3	0.00	0.00E+00	0.00E+00
	AVERAGE =	0.00E+00	0.00E+00

iii. PERCENT REDUCTION = 100%

I. SELECTED RESULTS - OTAY LANDFILL (CONTINUED)

D. DICHLOROMETHANE RESULTS

i. INLET EMISSIONS

RUN NO.	PPB	LB/HR
1	6180	4.88E-02
2	6010	4.75E-02
3	6200	4.90E-02
	AVERAGE =	4.84E-02

ii. EXHAUST EMISSIONS

RUN NO.	PPB	LB/HR	LB/SCF OF LFG
1	437.0	3.74E-02	1.06E-06
2	365.0	3.12E-02	8.85E-07
3	410.0	3.51E-02	9.94E-07
	AVERAGES =	3.46E-02	9.80E-07

iii. PERCENT REDUCTION = 28.5%

SELECTED RESULTS - OTAY LANDFILL (CONTINUED)

E. BENZENE RESULTS

i. INLET EMISSIONS

RUN NO.	PPB	LB/HR
1	1700	1.23E-02
2	1700	1.23E-02
3	1620	1.18E-02
	AVERAGE =	1.21E-02

ii. EXHAUST EMISSIONS

RUN NO.	PPB	LB/HR	LB/SCF OF LFG
1	36.10	2.84E-03	8.05E-08
2	33.70	2.65E-03	7.51E-07
3	30.20	2.37E-03	6.73E-08
	AVERAGE =	2.62E-03	3.00E-07

iii. PERCENT REDUCTION = 78.3%

I. SELECTED RESULTS - OTAY LANDFILL (CONTINUED)

F. TOTAL SULFUR COMPOUNDS RESULTS

i. INLET EMISSIONS

RUN NO.	PPM	LB/HR
1	51.41	1.74E-01
2	50.82	1.73E-01
3	50.48	1.71E-01
	AVERAGE =	1.73E-01

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II. INTRODUCTION

II. INTRODUCTION

On April 2-5, South Coast Environmental Company (SCEC) conducted a source test on landfill gas-fired Internal Combustion Engine (ICE) #1 at Pacific Energy (PEn) Otay Landfill located in Chula Vista, CA. Testing was performed in compliance with AB2588.

CARB Method 430 was performed in triplicate at the exhaust to determine Formaldehyde emissions. CARB Method 421 was performed in triplicate at the exhaust to determine Hydrogen Chloride (HCL) emissions. A single HCL run was performed at the inlet fuel gas to the IC Engine. Triplicate fuel and exhaust samples were obtained and analyzed for Vinyl Chloride and Dichloromethane using CARB Method 422. Triplicate fuel and exhaust samples were obtained and analyzed for Benzene using CARB Method 410. Triplicate fuel samples were obtained and analyzed for total sulfur compounds using CARB Method 16.

Enseco Laboratory (Garden Grove) performed all HCL analysis. Atmospheric Assessment performed analysis for total sulfur compounds, vinyl chloride, dichloromethane, and benzene. Air Toxics Laboratory conducted the Formaldehyde analysis.

Testing for SCEC was performed by Ms. Leslie A. Johnson - Project Manager, Mr. Keith B. Shannon - Project Engineer, and Mr. Russ P. Logan - Project Engineer. On-site testing was coordinated by Mr. Terence Hee and Mr. Dennis Marsh of PEn. John Jackson of San Diego Air Pollution Control District was also present to witness the test.

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III. FORMALDEHYDE RESULTS

COMPANY: PACIFIC ENERGY
DATE: APRIL 2, 1991
UNIT: ICE #1-EXHAUST
REPORT: T1265

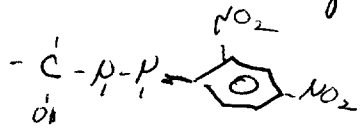
CARB METHOD #430 RESULTS

RUN #	PARAMETER	UG/SAMPLE COLLECTED	BLANK	UG/SAMPLE	LB/HR*	LB/SCF LFG**
#1	FORMALDEHYDE	700	2.4	7.00E+02	3.98E-02	1.13E-06
#2	FORMALDEHYDE	480	2.4	4.80E+02	2.90E-02	8.23E-07
#3	FORMALDEHYDE	570	2.4	5.70E+02	3.61E-02	1.02E-06
				AVERAGE =	3.50E-02	9.91E-07

*LB UG SAMPLE DSCF GRAMS 60 MIN 1 LB ~~30 G/GMOLE~~
--=
HR SAMPLE DSCF MIN 1E+6UG HR 453.6G ~~210 G/GMOLE~~

** LB LB 1 HR 1 MIN
=
SCF LFG HR 60 MIN 588 SCF LFG

Formaldehyde hydrazone



ADDITIONAL INFORMATION

RUN#	DSCF	DSCM	VOL. FLOW DSCFM***
#1	2.12	0.060	6371
#2	1.99	0.056	6371
#3	1.90	0.054	6371

*** AVERAGE OF ALL THREE HCL RUNS.

PACIFIC ENERGY
PROJECT NO. T1265

VOLUME STANDARDIZATION FOR FORMALDEHYDE RUNS

$$DSCF = CFmeter\ (Y) * \frac{528}{TM + 460} * \frac{Pstd}{29.92}$$

Engine #1
Run #1 $= 2.25(1.0009) * \frac{528}{98 + 460} * \frac{29.76}{29.92}$

DSCF = 2.12

Engine #1
Run #2 $= 2.08(1.0009) * \frac{528}{89 + 460} * \frac{29.76}{29.92}$

DSCF = 1.99

Engine #1
Run #3 $= 2.03\overset{1.0024}{(1.0009)} * \frac{528}{101 + 460} * \frac{29.76}{29.92}$

$= 1.904$ **DSCF = 1.90**

Engine #1
Run #4 (Blank) $= 2.27(1.0009) * \frac{528}{103 + 460} * \frac{29.76}{29.92}$

DSCF = 2.12

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IV. HYDROGEN CHLORIDE AND CHLORINE RESULTS

COMPANY: PACIFIC ENERGY
DATE: APRIL 2, 1991
UNIT: ICE#1-OTAY LANDFILL (HCL)
REPORT: T1265

CARB METHOD #421 RESULTS

RUN #	PARAMETER	UG/SAMPLE COLLECTED	BLANK	UG/SAMPLE	LB/HR**	LB/SCF LFG**
#1	HCL	33800	376	3.38E+04	3.90E-01	1.10E-05
#2	HCL	24800	376	2.48E+04	3.08E-01	8.74E-06
#3	HCL	25400	376	2.54E+04	3.10E-01	8.78E-06
				AVERAGE =	3.36E-01	9.52E-06

* LB	UG	SAMPLE	DSCF	GRAMS	60 MIN	1 LB
HR	SAMPLE	DSCF	MIN	1E+6	HR	453.6G

** LB	LB	1 HR	1 MIN
SCF LFG	HR	60	588 SCF LFG

ADDITIONAL INFORMATION

RUN#	DSCF	DSCM	VOL. FLOW DSCFM
#1	72.92	2.065	6371
#2	67.66	1.916	6371
#3	68.98	1.954	6371

COMPANY: PACIFIC ENERGY
DATE: APRIL 2, 1991
UNIT: ICE#1-OTAY LANDFILL (HCL)
REPORT: T1265

CARB METHOD #421 RESULTS

RUN #	PARAMETER	MG/SAMPLE COLLECTED	BLANK	MG/SAMPLE	LB/HR**
#1	HCL	455	0	4.55E+02	1.25E+00

* LB	MG	SAMPLE	DSCF	GRAMS	60 MIN	1 LB
HR	SAMPLE	DSCF	MIN	1E+3	HR	453.6G

ADDITIONAL INFORMATION

RUN#	DSCF	DSCM	VOL. FLOW DSCFM
#1	28.23	0.799	588

COMPANY: PACIFIC ENERGY
DATE: APRIL 2, 1991
UNIT: ICE #1-OTAY LANDFILL (TOTAL RESIDUAL CL) INLET EMISSIONS
REPORT: T1265

EPA METHOD 330.4

RUN #	PARAMETER	MG/LITER COLLECTED	SAMPLE VOL (L)	MG/SAMPLE	CONC. MG/DSCM*	LB/HR**
#1	CHLORINE	0.25	0.223	5.58E-02	6.97E-02	1.53E-04

* CONVERSION FACTOR FROM DSCF TO DSCM = 2.832*E-2

**LB MG LITERS SAMPLE DSCF GRAMS 60 MIN 1 LB
--=
HR LITER SAMPLE DSCF MIN 1E+3 HR 453.6G

ADDITIONAL INFORMATION

RUN#	DSCF	DSCM	VOL. FLOW DSCFM
#1	28.23	0.799	588

COMPANY: PACIFIC ENERGY
DATE: 4-2-91 thur 4-5-91
UNIT: ICE #1
REPORT #:T-1265

FIELD DATA @ 68'

SITE: OUTLET

RUN #:	1	2	3
TIME:	1230	810	1030
Vm (dry gas sampled)	77.77	71.979	74.123
Y (meter calib. factor)	1.0009	1.0009	1.0009
P bar (Barometric pressure)	29.76	29.61	29.61
P static (stack pressure, " H2O)	4.6	4.6	4.6
Delta H (differential meter press, " H2O)	2.47	2.1	2.16
Tm (meter temperature, R')	564	559.3	565
Vol H2O mls	236	173.6	208.8
Vm(std),dscf	72.92	67.66	68.98
Bws-H2O vapor	0.1324	0.1079	0.1249
MF-moisture factor	0.8676	0.8921	0.8751
% CO2	11.62	11.62	11.62
% O2	8.01	8.01	8.01
% N2	80.37	80.37	80.37
Md-MW stk gas,dry	30.18	30.18	30.18
Ms-MW stk gas,wet	28.57	28.87	28.66
Cp-pitot tube	0.84	0.84	0.84
Avg sq rt ^p	1.838	1.905	1.908
T stack, R'	1204	1309	1319
Stack area,ft2	1.77	1.77	1.77
Vs-fps	156.18	168.33	169.85
Qstd-dscfm	6348	6439	6325
Area noz,ft2	2.27E-04	2.07E-04	2.07E-04
Sample time	90	90	90
% Isokinetic	101.1	101.2	105

AVERAGE DSCFM FOR ALL THREE RUNS = 6371

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V. VINYL CHLORIDE, DICHLOROMETHANE, AND BENZENE RESULTS

CLIENT: PACIFIC ENERGY
JOB NO: T1220
UNIT: ICE #1-INLET (OTAY LANDFILL)
DATE: APRIL 2, 1991
RUN #: #1

SELECTED CHLORINATED AND BROMINATED HYDROCARBONS

PARAMETER	PPB	MW	LB/HR*
VINYLE CHLORIDE	5270.00	62.50	3.06E-02
DICHLOROMETHANE	6180.00	85.00	4.88E-02
BENZENE	1700.00	78.12	1.23E-02

*EQUATION 1: lb/hr = PPB * MW *1.583E-10 * DSCFM

PPB = parts per billion, concentration
MW = molecular weight
1.583E-10 = conversion factor
DSCFM = Dry standard cubic feet per minute = 588
(TAKEN FROM IC ENGINE FIELD DATE SHEET)

CLIENT: PACIFIC ENERGY
JOB NO: T1220
UNIT: ICE #1-INLET (OTAY LANDFILL)
DATE: APRIL 2, 1991
RUN #: #2

SELECTED CHLORINATED AND BROMINATED HYDROCARBONS

PARAMETER	PPB	MW	LB/HR*
VINYLE CHLORIDE	5340.00	62.50	3.10E-02
DICHLOROMETHANE	6010.00	85.00	4.75E-02
BENZENE	1700.00	78.12	1.23E-02

*EQUATION 1: lb/hr = PPB * MW *1.583E-10 * DSCFM

PPB = parts per billion, concentration
MW = molecular weight
1.583E-10 = conversion factor
DSCFM = Dry standard cubic feet per minute = 588
(TAKEN FROM IC ENGINE FIELD DATE SHEET)

CLIENT: PACIFIC ENERGY
JOB NO: T1220
UNIT: ICE #1-INLET (OTAY LANDFILL)
DATE: APRIL 2, 1991
RUN #: #3

SELECTED CHLORINATED AND BROMINATED HYDROCARBONS

PARAMETER	PPB	MW	LB/HR*
VINYLE CHLORIDE	5420.00	62.50	3.15E-02
DICHLOROMETHANE	6200.00	85.00	4.90E-02
BENZENE	1620.00	78.12	1.18E-02

*EQUATION 1: lb/hr = PPB * MW *1.583E-10 * DSCFM

PPB = parts per billion, concentration
MW = molecular weight
1.583E-10 = conversion factor
DSCFM = Dry standard cubic feet per minute = 588
(TAKEN FROM IC ENGINE FIELD DATE SHEET)

CLIENT: PACIFIC ENERGY
JOB NO: T1220
UNIT: ICE #1-EXHAUST (OTAY LANDFILL)
DATE: APRIL 2, 1991
RUN #: #1

SELECTED CHLORINATED AND BROMINATED HYDROCARBONS

PARAMETER	PPB	MW	LB/HR*	LB/SCF LFG**
VINYLE CHLORIDE	0.00	62.50	0.00E+00	0.00E+00
DICHLOROMETHANE	437.00	85.00	3.74E-02	1.06E-06
BENZENE	36.10	78.12	2.84E-03	8.05E-08

*EQUATION 1: lb/hr = PPB * MW *1.583E-10 * DSCFM

PPB = parts per billion, concentration
MW = molecular weight
1.583E-10 = conversion factor
DSCFM = Dry standard cubic feet per minute = 6371
(AVE. OF 3 HCL RUNS)

**EQUATION 2: LB/SCF LFG = (LB/HR)/((SCFM LFG)*60 MIN/HR)

SCFM LFG = 588
(TAKEN FROM IC ENGINE FIELD DATA SHEET)

CL CLIENT: PACIFIC ENERGY
JO JOB NO: T1220
UN UNIT: ICE #1-EXHAUST (OTAY LANDFILL)
DA DATE: APRIL 2, 1991
RU RUN #: #2

SELECTED CHLORINATED AND BROMINATED HYDROCARBONS

PAI	PARAMETER	PPB	MW	LB/HR*	LB/SCF LFG**
VI	VINYLE CHLORIDE	0.00	62.50	0.00E+00	0.00E+00
DI	DICHLOROMETHANE	365.00	85.00	3.12E-02	8.85E-07
BE	BENZENE	33.70	78.12	2.65E-03	7.51E-08

*E(*EQUATION 1: lb/hr = PPB * MW *1.583E-10 * DSCFM

PPB = parts per billion, concentration
MW = molecular weight
1.583E-10 = conversion factor
DSCFM = Dry standard cubic feet per minute = 6371
(AVE. OF 3 HCL RUNS)

**E **EQUATION 2: LB/SCF LFG = (LB/HR)/((SCFM LFG)*60 MIN/HR)

SCFM LFG = 588
(TAKEN FROM IC ENGINE FIELD DATA SHEET)

CLIENT: PACIFIC ENERGY
JOB NO: T1220
UNIT: ICE #1-EXHAUST (OTAY LANDFILL)
DATE: APRIL 2, 1991
RUN #: #3

SELECTED CHLORINATED AND BROMINATED HYDROCARBONS

PARAMETER	PPB	MW	LB/HR*	LB/SCF LFG**
VINYLE CHLORIDE	0.00	62.50	0.00E+00	0.00E+00
DICHLOROMETHANE	410.00	85.00	3.51E-02	9.94E-07
BENZENE	30.20	78.12	2.37E-03	6.73E-08

*EQUATION 1: lb/hr = PPB * MW *1.583E-10 * DSCFM

PPB = parts per billion, concentration
MW = molecular weight
1.583E-10 = conversion factor
DSCFM = Dry standard cubic feet per minute = 6371
(AVE. OF 3 HCL RUNS)

**EQUATION 2: LB/SCF LFG = (LB/HR)/((SCFM LFG)*60 MIN/HR)

SCFM LFG = 588
(TAKEN FROM IC ENGINE FIELD DATA SHEET)

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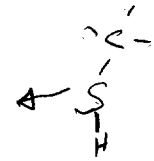
VI. TOTAL SULFUR COMPOUND RESULTS

CLIENT: PACIFIC ENERGY
JOB NO: T1220
UNIT: ICE #1-INLET (OTAY LANDFILL)
DATE: APRIL 2, 1991
RUN #: #1

SELECTED SULFUR COMPOUNDS

PARAMETER	PPM	MW	LB/HR*
HYDROGEN SULFIDE	46.60	34.08	1.48E-01
METHYL MERCAPTAN	1.22	48.11	5.45E-03
DIMETHYL SULFIDE	3.59	62.13	2.07E-02
TOTAL SULFUR COMPOUNDS	51.41		1.74E-01



*EQUATION 1: lb/hr = PPM * MW *1.583E-07 * DSCFM

PPM = parts per million, concentration
MW = molecular weight
1.583E-07 = conversion factor
DSCFM = Dry standard cubic feet per minute = 588
(TAKEN FROM IC ENGINE FIELD DATA SHEET)

CLIENT: PACIFIC ENERGY
JOB NO: T1220
UNIT: ICE #1-INLET (OTAY LANDFILL)
DATE: APRIL 2, 1991
RUN #: #2

SELECTED SULFUR COMPOUNDS

PARAMETER	PPM	MW	LB/HR*
HYDROGEN SULFIDE	45.70	34.08	1.45E-01
METHYL MERCAPTAN	1.30	48.11	5.81E-03
DIMETHYL SULFIDE	3.82	62.13	2.20E-02
TOTAL SULFUR COMPOUNDS	50.82		1.73E-01

*EQUATION 1: lb/hr = PPM * MW *1.583E-07 * DSCFM

PPM = parts per million, concentration
MW = molecular weight
1.583E-07 = conversion factor
DSCFM = Dry standard cubic feet per minute = 588
(TAKEN FROM IC ENGINE FIELD DATA SHEET)

CLIENT: PACIFIC ENERGY
JOB NO: T1220
UNIT: ICE #1-INLET (OTAY LANDFILL)
DATE: APRIL 2, 1991
RUN #: #3

SELECTED SULFUR COMPOUNDS

PARAMETER	PPM	MW	LB/HR*
HYDROGEN SULFIDE	45.40	34.08	1.44E-01
METHYL MERCAPTAN	1.28	48.11	5.72E-03
DIMETHYL SULFIDE	3.80	62.13	2.19E-02
TOTAL SULFUR COMPOUNDS	50.48		1.71E-01

*EQUATION 1: lb/hr = PPM * MW *1.583E-07 * DSCFM

PPM = parts per million, concentration
MW = molecular weight
1.583E-07 = conversion factor
DSCFM = Dry standard cubic feet per minute = 588
(TAKEN FROM IC ENGINE FIELD DATA SHEET)

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VII. SAMPLING AND ANALYTICAL PROCEDURES

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South Coast Environmental Company
1915 McKinley Avenue, Suite E
La Verne, CA 91750

SAMPLING AND ANALYTICAL PROCEDURES

CARB METHOD #1 - SAMPLING AND VELOCITY TRAVERSE FOR STATIONARY SOURCES

A preliminary source test site assessment was performed prior to the source test in order to determine applicable testing port locations and sample point traverse locations. The stack diameter, and the distance from sample ports to disturbances, i.e. bends, flanges, etc..., both upstream and downstream, were measured. This information was utilized to determine the minimum number of sampling points per traverse, and the distance from the inner stack wall to each sample point location. Additionally, this method takes into account cyclonic flow patterns and in-situ stratified pollutant concentrations.

CARB METHOD #2 - VELOCITY AND VOLUMETRIC FLOW RATE

The velocity of the gas stream was determined by using an "s" type pitot tube, a magnehelic differential pressure gauge, and type "K" thermocouple with a digital temperature measuring device. The calibrated pitot tube was connected to the magnehelic gauge and leak checked. A temperature and delta P was obtained at each traverse point, and a duct static pressure was measured and recorded. The dry volumetric flow rate was determined from the gas velocity data, stack pressure, stack gas moisture content, stack gas molecular weight, and cross-sectional area of duct.

CARB METHOD #3 - GAS ANALYSIS FOR DRY MOLECULAR WEIGHT AND EXCESS AIR

A gas sample was extracted from the stack using a tedlar bag, teflon line, stainless steel probe, leak free pump (if necessary), and leak free container (if necessary). Alternatively, the gas sample may be obtained at the outlet of the gas meter of a collection train, or the bypass of our CARB Method 100 manifold. The gas sample was analyzed for CO_2 and O_2 using an orsat analyzer. Prior to analysis all orsat reagents were checked against manufacturer expiration dates, and a leak check was performed on the manifold of the orsat apparatus. The sample gas was passed through each impactor/bubbler three times before a percent reading was recorded.

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SAMPLING AND ANALYTICAL PROCEDURES

CARB METHOD #4 - DETERMINATION OF MOISTURE CONTENT IN STACK GASES

Moisture content was determined using a sampling train consisting of a stainless steel probe, teflon line, four impingers in an ice water bath, leak free pump, vacuum gauge, and temperature compensated dry gas meter. Prior to sampling a leak check of the sampling train was performed to insure system integrity. Additionally, tare weights of the charged individual impingers were recorded using a triple beam balance capable of weighing to the nearest 0.1 grams or less.

After sampling, the final weights of each impinger were determined and recorded. Percent moisture content was calculated from the weight of water collected and the dry gas volume sampled.

CALCULATIONS

$$\text{Moisture } (B_w) = \frac{\text{Vwstd}}{\text{Vmstd} + \text{Vwstd}} \times 100$$

Where: $\text{Vwstd} = \frac{0.0471\ ft^3}{ml} * \text{Vol } H_2O \text{ Collected (ml)}$

$$\text{Vmstd} = \text{Y Meter} * \frac{528°R}{29.92 \text{ in Hg}} * \frac{\text{Vol Metered}}{\text{Temp. Meter}} * \text{Pres. Meter.}$$

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CARB METHOD 410A

INTRODUCTION

The Method 410A sampling apparatus was used to collect low level benzene concentrations from stationary sources in ten liter Tedlar bags.

SAMPLING PROCEDURE

The apparatus consisted of a stainless steel probe connected by teflon line to a Tedlar sample bag contained in an air tight canister. Upon evacuation of the air in the canister, sample gas was drawn into the bag.

On completion of each run, the bag sample was sealed and immediately transported to the laboratory. Sample was then drawn through a septum and injected into the GC/PID for analysis.

CALCULATIONS

$$\frac{lb}{hr} = PPBv * DSCFM * M.W. * 1.583\ E-10$$

Where: PPB = Parts Per Billion (Volume)
DSCFM = Dry Standard Cubic Feet per Minute of Exhaust
M.W. = Molecular Weight of Benzene (78.011 lb/lb mole)
1.583 E-10 = Conversion Factor

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