Air Liquide Electronics U.S. LP
46409 Landing Parkway, Fremont CA 94538
Telephone (510) 624-4000 Fax (510) 657-2292

MR JIM VENCE
DETREX ELCO CORPORATION
1100 STATE ROAD
ASHTABULA OH 44004
UNITED STATES

Phone: **(440) 997-6131**
Email: **JVence@elcocorp.com**

Work Order: **15-08421**
Revision: **1**
Report Date: **30-Nov-15**
Order Date: **19-Nov-15**
P.O.: **32777**
Release:
Approved By: **Tiffany Wilkus**
Title: **ORGANIC LAB SUPERVISOR**

BALAZS ™ TEST RESULTS

If you have any questions regarding the results, please call Hugh Gotts at (510) 624-4028

Background and Summary:

One HCl sample was received for qualitative analysis by gas chromatography mass spectrometry (GC-MS) and quantitative analysis by gas chromatography flame ionization detection (GC-FID) to evaluate volatile organic contaminants, specifically chlorobenzene.

Sample ID	Sample Mass (g)
HCl 23 Deg; Lot 111015-122	125.461

Sample Preparation:

A known amount of sample was diluted approximately 1:1 with water and extract with 50 mL of methylene chloride (CH2Cl2) three times. The extracted fractions were collected and concentrated to 0.5 mL. The solution was spiked with a known volume of **n-Hexadecane** internal standard for GC-MS and GC-FID analyses.

GC-MS Instrumentation:

The system used for the analysis was an HP 6890 GC (Gas Chromatograph) with a 5973 quadrupole MSD (Mass Selective Detector).

The GC was equipped with a non-polar poly (dimethylsiloxane) phase capillary column. The following temperature program was used for the GC: the oven was held at an initial temperature of 40 °C for 2 minutes, ramped at a rate of 15°C/minute to 280°C, and held at the final temperature for 30 minutes. A 1.0

µL portion was injected, the injection port temperature was 280°C and the GC was operated with a split ratio of 20:1.

Each compound passed down the GC column at a characteristic rate. As each compound exited the gas chromatograph, it entered the MSD where it was ionized using electron impact ionization (70eV). The MSD collected a full mass spectrum (10-700 amu) approximately once per second.

GC-MS Results:

-A labeled chromatogram is included for each sample.

GC-FID Instrumentation:

The system used for the analysis was an HP 6890 GC (Gas Chromatograph) with a 5973 quadrupole MSD (Mass Selective Detector).

The GC was equipped with a non-polar poly (dimethylsiloxane) phase capillary column. The following temperature program was used for the GC: the oven was ramped from 60°C to 230°C at a rate of 15°C/ minute and held at the final temperature for 10 minutes. A 1.2µL portion was injected, the injection port temperature was 280°C and the GC was operated with a split ratio of 5:1.

Each compound passed down the GC column at a characteristic rate. As each compound exited the gas chromatograph, it entered the FID.

GC-FID Results:

-Chlorobenzene was not detected at or above the reporting limit of 1 ppbV.

BALAZS™ nanoAnalysis
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Sample: 1058323 [HCl 23 Deg; Lot 111015 -122]

Site ID:

Component	Detection Limit	Result Value	Units
G0111-GCL-N-R-C Solvent (Mixture) Normalized Area % Assay by GC- FID			
Chlorobenzene	1	*	ppbV

* = Analysis revealed that the analyte was not found at or about the detection limit

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Figure 1
Sample ID: Control; CH_2Cl_2 Extraction Blank
Method of Analysis: Liquid extraction followed by liquid Injection-GC-MS (Gas Chromatography-Mass Spectrometry)
Objective: Pure solvent analysis by GC-MS – Qualitative.
Sampling Conditions: Direct injection of extracted solution.
Balazs Work Order: 15-08421

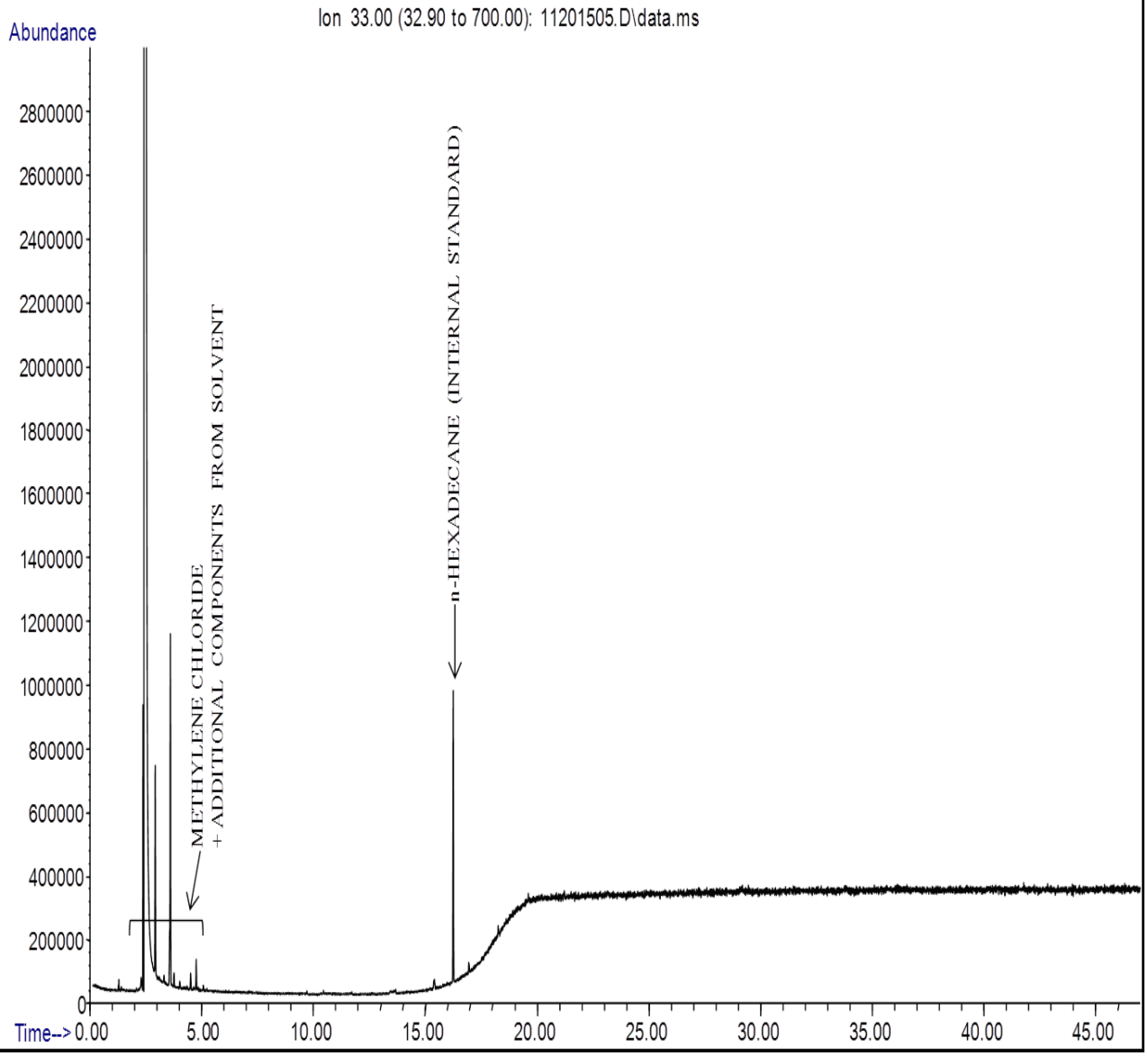

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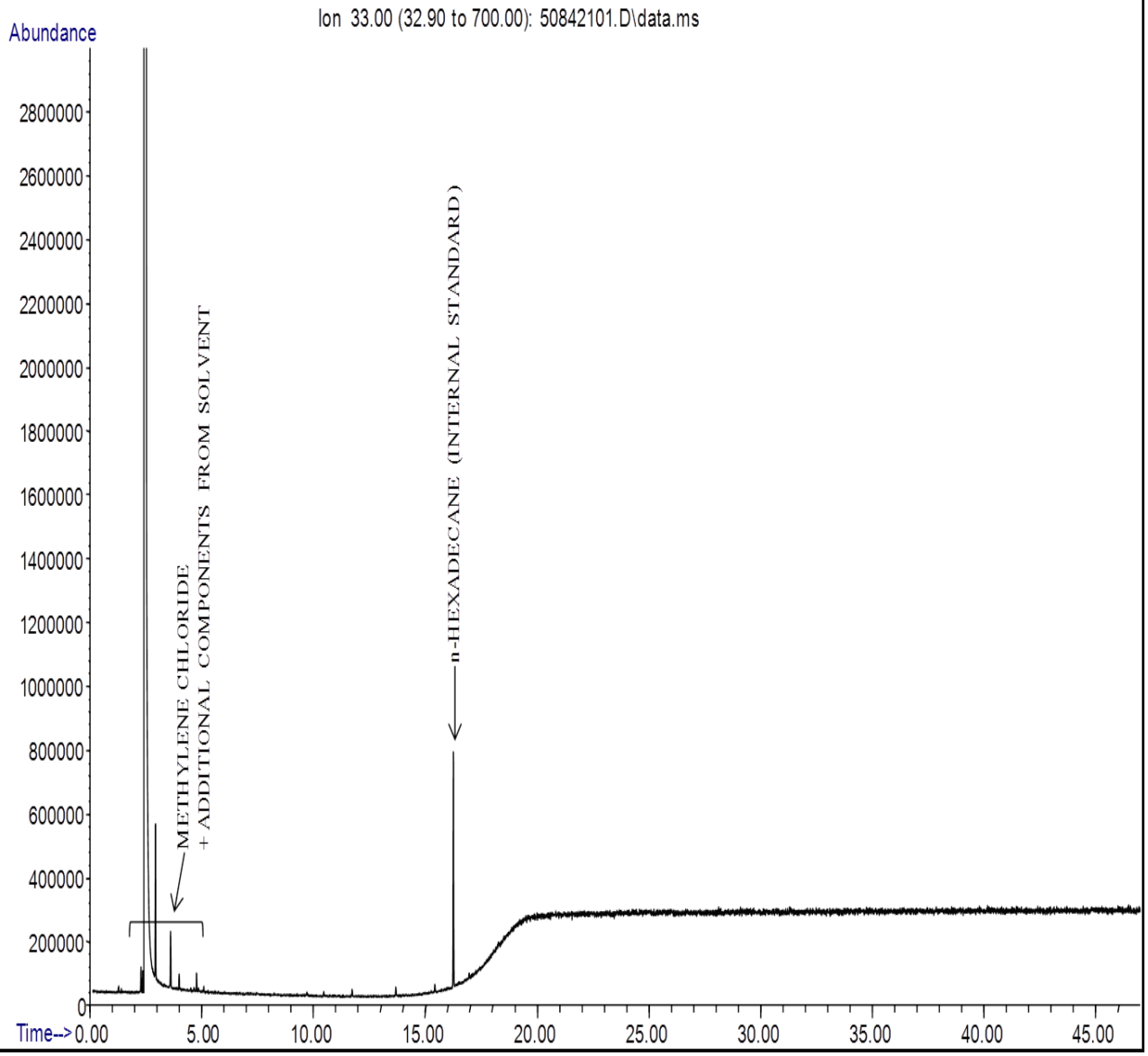
Figure 2
Sample ID: HCl 23 Deg; Lot 111015-122
Method of Analysis: Liquid extraction followed by liquid Injection-GC-MS (Gas Chromatography-Mass Spectrometry)
Objective: Pure solvent analysis by GC-MS – Qualitative.
Sampling Conditions: Direct injection of extracted solution.
Balazs Work Order: 15-08421



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