

Evape

Wasaga Beach, Ontario

e-Liquid Samples ECTA of Canada

Analysis Report (0616-523)

GC/FID Analysis (ENT184)

Nicotine, Diethylene glycol (DEG)

HPLC/UV Analysis (ENT301)

Acetaldehyde, Acetoin, Diacetyl, Formaldehyde,
2,3-Pentanedione (aka Acetyl propionyl)

General Lab Services (ENT058 & 072)

pH Level, Karl Fisher Titration, % Water



Enthalpy Analytical, Inc.

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I certify that to the best of my knowledge all analytical data presented in this report:

- Have been checked for completeness
- Are accurate, error-free, and legible
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s)

This analytical report was prepared in Portable Document Format (.PDF) and contains 15 pages.

Report Issued: 7/27/2016



Summary of Results



Report for: Evape
 Client Project: ECTA of Canada
 Sample Type: e-Liquid

Project Code: 0616-523
 Project Start Date: 6/7/16
 Analysis Method: ENT184

Limit of Quantitation (LOQ), mg/mL	0.496
Minimum Detection Limit (MDL), mg/mL	0.100

Enthalpy Code	Client Sample ID	Notes	Nicotine (mg/mL)
0616-523-01	ECTA008-19	Velocity 12mg	11.1
0616-523-02	ECTA008-20	Climax 6mg	5.35
0616-523-03	ECTA008-21	Everest 3mg	2.85
0616-523-04	ECTA008-22	Karma 18mg	18.4
0616-523-05	ECTA008-23	Epiphany 0mg	ND
0616-523-06	ECTA008-24	Barren 12mg	9.38
0616-523-07	ECTA008-25	Tranquility 18mg	22.8
0616-523-08	ECTA008-26	Discovery 6mg	5.51

ND: Not Detected; analyte not detected above the MDL

Report for: Evape
 Client Project: ECTA of Canada
 Sample Type: e-Liquid

Project Code: 0616-523
 Project Start Date: 6/7/16
 Analysis Methods: ENT184

Limit of Quantitation (LOQ), ug/mL	55.7
Minimum Detection Limit (MDL), ug/mL	11.8

Enthalpy Code	Client Code	Notes	Diethylene glycol (ug/mL)
0616-523-01	ECTA008-19	Velocity 12mg	ND
0616-523-02	ECTA008-20	Climax 6mg	< LOQ
0616-523-03	ECTA008-21	Everest 3mg	ND
0616-523-04	ECTA008-22	Karma 18mg	ND
0616-523-05	ECTA008-23	Epiphany 0mg	ND
0616-523-06	ECTA008-24	Barren 12mg	ND
0616-523-07	ECTA008-25	Tranquility 18mg	ND
0616-523-08	ECTA008-26	Discovery 6mg	ND

ND: Non Detect or analytical result is below the MDL.

< LOQ: Analytical result is below the LOQ.



Report for: Evape
 Client Project: ECTA of Canada
 Sample Type: e-Liquid

Project Code: 0616-523
 Project Start Date: 6/7/16
 Analysis Method: ENT301

Limit of Quantitation (LOQ), ug/mL	1.91	1.83	1.79	1.91	1.70
Minimum Detection Limit (MDL), ug/mL	0.191	0.280	0.199	0.191	0.328

Blank Adjusted Concentrations, ug/mL

Enthalpy Code	Client Code	Notes	Acetaldehyde (ug/mL)	Acetoin (ug/mL)	Diacetyl (ug/mL)	Formaldehyde (ug/mL)	2,3-
							Pentanedione# (ug/mL)
0616-523-01-1A	ECTA008-19	Velocity 12mg	< LOQ	ND	ND	< LOQ	< LOQ
0616-523-01-2A			< LOQ	ND	ND	< LOQ	< LOQ
Average			Average	< LOQ	ND	ND	< LOQ
			%DIFF	%DIFF	NA	NA	NA
0616-523-02-1A	ECTA008-20	Climax 6mg	< LOQ	4.67 *	ND	1.92	1.70
0616-523-02-2A			1.93	4.74 *	ND	2.05	1.95
Average			Average	< LOQ	4.70	ND	1.99
			%DIFF	%DIFF	NA	6.72	13.4
0616-523-03-1A	ECTA008-21	Everest 3mg	< LOQ	ND	ND	< LOQ	ND
0616-523-03-2A			< LOQ	ND	ND	< LOQ	ND
Average			Average	< LOQ	ND	ND	< LOQ
			%DIFF	%DIFF	NA	NA	NA
0616-523-04-1A	ECTA008-22	Karma 18mg	< LOQ	ND	ND	2.13	ND
0616-523-04-2A			< LOQ	ND	ND	2.20	ND
Average			Average	< LOQ	ND	ND	2.16
			%DIFF	%DIFF	NA	3.37	NA



Report for: Evape
 Client Project: ECTA of Canada
 Sample Type: e-Liquid

Project Code: 0616-523
 Project Start Date: 6/7/16
 Analysis Method: ENT301

Limit of Quantitation (LOQ), ug/mL	1.91	1.83	1.79	1.91	1.70
Minimum Detection Limit (MDL), ug/mL	0.191	0.280	0.199	0.191	0.328

Blank Adjusted Concentrations, ug/mL

Enthalpy Code	Client Code	Notes	Acetaldehyde (ug/mL)	Acetoin (ug/mL)	Diacetyl (ug/mL)	Formaldehyde (ug/mL)	2,3- Pentanedione [#] (ug/mL)
0616-523-05-1A	ECTA008-23	Epiphany 0mg	2.04	ND	ND	< LOQ	< LOQ
0616-523-05-2A			< LOQ	ND	ND	< LOQ	1.77
Average			Average	1.94	ND	ND	< LOQ
			%DIFF	%DIFF	10.2	NA	NA
0616-523-06-1A	ECTA008-24	Barren 12mg	< LOQ	ND	ND	< LOQ	ND
0616-523-06-2A			< LOQ	ND	ND	< LOQ	ND
Average			Average	< LOQ	ND	ND	< LOQ
			%DIFF	%DIFF	NA	NA	NA
0616-523-07-1A	ECTA008-25	Tranquility 18mg	< LOQ	ND	ND	2.13	2.66 *
0616-523-07-2A			< LOQ	ND	ND	2.22	3.12 *
Average			Average	< LOQ	ND	ND	2.17
			%DIFF	%DIFF	NA	4.15	15.8
0616-523-08-1A	ECTA008-26	Discovery 6mg	2.47	ND	ND	< LOQ	ND
0616-523-08-2A			2.43	ND	ND	< LOQ	ND
Average			Average	2.45	ND	ND	< LOQ
			%DIFF	%DIFF	1.30	NA	NA

2,3-pentanedione is also known as acetyl propionyl.

ND: Non Detect or analytical result is below the MDL.

< LOQ: Results are below the LOQ and above the MDL.

*: Sample contained an interference for that compound; results may be biased low.

Report for: Evape
Client Project: ECTA of Canada
Sample Type: e-Liquid

Project Code: 0616-523
Project Start Date: 6/7/16
Analysis Methods: ENT058 & 072

Enthalpy Code	Client Code	Notes	% Water	pH
0616-523-01	ECTA008-19	Velocity 12mg	5.93	5.49
0616-523-02	ECTA008-20	Climax 6mg	6.56	7.60
0616-523-03	ECTA008-21	Everest 3mg	0.87	8.38
0616-523-04	ECTA008-22	Karma 18mg	6.64	8.35
0616-523-05	ECTA008-23	Epiphany 0mg	1.40	5.92
0616-523-06	ECTA008-24	Barren 12mg	0.87	8.75
0616-523-07	ECTA008-25	Tranquility 18mg	4.00	8.57
0616-523-08	ECTA008-26	Discovery 6mg	1.37	7.91

Narrative Summary

Enthalpy Analytical Narrative Summary

Company	Evape
Analysts	KEH, ABP, TMS/CH
Parameters	ENT184, 301, 058, 072

Client Proj	ECTA of Canada
Job #	0616-523
# Samples	8 e-Liquid samples

Custody

Tiffany Stein received the samples on 6/14/16 after being relinquished by Infinite Vaper & All E-Cig Solutions. The samples were received at ambient temperature and in good condition. Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, Inc.

Analysis (Nicotine)

The e-Liquid samples were prepared and analyzed for nicotine following the analytical procedures in Enthalpy SOP ENT184.

The Hewlett Packard Model 5890 Series II Gas Chromatograph “Ricky” was equipped with a Flame Ionization Detector (FID) and an appropriate column.

Analysis (DEG)

The e-Liquid samples were prepared and analyzed for diethylene glycol (DEG) following the analytical procedures in Enthalpy SOP ENT184.

The Hewlett Packard Model 5890 Series II Gas Chromatograph “Ricky” was equipped with a Flame Ionization Detector (FID) and an appropriate column.

Analysis (Carbonyls)

The e-Liquid samples were analyzed for acetaldehyde, acetoin, diacetyl, formaldehyde, and 2,3-pentanedione (aka acetyl propionyl) following the procedures in Enthalpy SOP ENT301.

The samples were analyzed using the Agilent Model 1100, High Performance Liquid Chromatograph “Groucho,” equipped with an Ultraviolet (UV) Detector operating at approximately 365 nm and an appropriate column.

Analysis (pH & KFT)

Samples were measured for pH using an Orion 230A pH meter according the Enthalpy SOP ENT058-Mod. Each sample was diluted to a 1% aqueous solution with DI water.



Enthalpy Analytical Narrative Summary (continued)

Analysis (pH & KFT continued)

Samples were analyzed for water content using the analytical procedures in Method FWN-4604 and Enthalpy SOP ENT072, *Determination of % Water by Karl Fischer Titration*. The % water results were determined on a Metrohm KFT Titrino Model 795 Titrator.

The titrations were performed in a dry methanol reagent. Titrant was purchased from Riedel de Haen and had a nominal titrant value of 5 mg water/mL titrant.

The 795 KFT uses an internal program and a programmable dosimeter to dispense titrant. Titrant values were read and printed to an Excel spreadsheet.

QC Notes

All QC samples were within acceptance criteria unless otherwise noted.

Formaldehyde was detected in the laboratory blank above the minimum detection limit (MDL) and the results have been blank corrected.

Reporting Notes

Sample 0616-523-02 (*ECTA008-20*) had a peak for diethylene glycol greater than the MDL. The result was confirmed by spiking the sample with diethylene glycol and analyzing the matrix spike to confirm that the retention time was for DEG. The matrix spike confirmed that the peak is DEG.

Sample 0616-523-02 (*ECTA008-20*) exhibited a small interference for acetoin; the result should be considered an estimate.

Sample 0616-523-07 (*ECTA008-25*) exhibited an interference for pentanedione; the result should be considered an estimate.

Sample and calibration curve chromatograms are available upon request.

The results presented in this report are representative of the samples as provided to the laboratory.

Please note that acetoin (aka 3-hydroxy-2-butanone), diacetyl, and 2,3-pentanedione (aka acetyl propionyl) may show false positive results via HPLC/UV in a small percentage of results. These can be confirmed via GC/MS.



General Reporting Notes

Acronym	Name	Explanation
BQL J < LOQ	<i>Below Quantitation Limit</i> <i>J-Flag</i> <i>Less than LOQ</i>	Indicates detection of the analyte, but at a value less than the LOQ. The laboratory can positively identify the presence of the analyte of interest, but it cannot be reliably quantitated.
DF	<i>Dilution Factor</i>	This number represents a dilution of the sample during the preparation and/or analysis process. The analytical result taken from a laboratory instrument is multiplied by the DF to determine the final, undiluted sample result.
E	<i>E-Flag</i>	Indicates an analytical result exceeding the highest calibration point. The associated value should be considered an estimate.
PCS	<i>Process Control Sample</i>	Clean matrix or a reference matrix that is prepared and analyzed using the same reagents, procedures and spiking standards (if applicable) used for the client samples. Used to assess the control of the laboratory's analytical system. Examples: LCS, 3R4F, CM7
LOQ	<i>Limit of Quantitation</i>	(aka: <i>Lowest Standard Value</i> or <i>Lower Curve Limit</i>). The laboratory cannot reliably quantitate analytes of interest below this value within method criteria. The result is considered an estimate.
MDL	<i>Minimum Detection Limit</i>	The laboratory cannot determine the presence of the analyte reliably below this value.
-Mod	<i>Modified</i>	Indicates that the SOP used has been modified to meet the needs of the analysis.
MS	<i>Matrix Spike</i>	An aliquot of an actual sample spiked with a known amount of analyte to determine possible percent recovery. The MS indicates what effect the sample matrix may have on the target analyte.
ND	<i>Non-Detect</i>	Indicates an analytical result below the MDL.

- **Significant Figures:** Where the reported value is much greater than unity (1.00) in the units expressed, the number is rounded to a whole number of units rather than to 3 significant figures. For example, a value of 1,456.45 ug/mL is rounded to 1,456 ug/mL. There are four significant digits displayed, but no confidence should be placed on more than two significant digits.
- **Manual Integration:** The data systems used for processing will flag manually integrated peaks with an "M." Several reasons a peak may be manually integrated (listed below) will be identified by two-letter designations on sample chromatograms, if provided in the report. These codes will accompany the analyst's manual integration stamp placed next to the compound name on the chromatogram.
 - **NI:** The peak was *not integrated* by the software
 - **II:** The peak was *integrated incorrectly* by the software
 - **WP:** The *wrong peak* was integrated by the software



Sample Custody



Chain of Custody Record

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Special Handling:

- Standard Turn Around Time (10 business days)
- Rush Turn Around Time -- Date Needed _____
- All TATs Subject to Approval by Enthalpy Analytical, Inc.
- All Bag/Can Samples Disposed of 1 Month from Receipt.
- All Other Samples Disposed of 4 Months from Receipt.

Client Name: Daniel David (Evape)
 Project Manager: _____
 Report To: _____

Project Number: ECTA of Canada
 Site Name: www.evape.ca
 Location: Wasaga Beach ON

PO#: _____
 Telephone#: 1-888-524-7043
 Email: Daniel@evape.ca

For spiked or duplicate samples: please provide sample volumes for recovery calculations.
 For Particulates: please provide tare weights and/or condensed water volumes.

Special Instructions:

A=Air 1=H2SO4 2=NaOH 3=_____ 4=_____
 X=XAD C=Charcoal SG=Silica Gel

G=Grab C=Composite Q=Quality Control

Sample ID	Date	Time	Sample Volume	Type	Matrix	Sample Containers							Analyses:	Notes:
						# of VOA Vials	# of Glass	# of Plastic	# of Bags	# of Canisters	# of Tubes	# Other		
ECTA008-19			30ml				2							Velocity 12mg
ECTA008-20			30ml				2							Climax 6mg
ECTA008-21			30ml				2							Everest 3mg
ECTA008-22			30ml				2							Karma 18mg
ECTA008-23			30ml				2							Epiphany 0mg
ECTA008-24			30ml				2							Baren 12mg
ECTA008-25			30ml				2							Tranquility 18mg
ECTA008-26			30ml				2							Discovery 6mg

Relinquished By: <u>[Signature]</u>	Date: <u>05/24/16</u>	Received By: <u>[Signature]</u>	Date: <u>07/16</u>	Time: <u>3:32</u>	Sample Condition Upon Receipt:
					<input type="checkbox"/> Iced <input checked="" type="checkbox"/> Ambient <input type="checkbox"/> °C _____
					<input type="checkbox"/> Iced <input type="checkbox"/> Ambient <input type="checkbox"/> °C _____
					<input type="checkbox"/> Iced <input type="checkbox"/> Ambient <input type="checkbox"/> °C _____

QA: JBF 6-8-16

**This Is The Last Page
Of This Report.**