

## LABORATORY REPORT

**SAMPLE NAME:** Rosemary *Rosmarinus Officinalis*

**BOTANICAL NAME:** *Rosmarinus officinalis*

**COMPANY NAME:** ACHS

**COMPANY LOT #:** 13126R

**Column:** ZB5 (60 m length × 0.25 mm inner diameter × 0.25 μm film thickness)

**Instrument:** Shimadzu GCMS-QP2010 Ultra

**Carrier gas:** Helium 80 psi

**Temperature ramp:** 2 degrees Celsius per minute up to 260-degree Celsius

**Split ratio:** 30:1

**Sample preparation:** 5% w/v solution with Dichloromethane

**Interpretation on sample:**

This oil meets the expected profile of *Rosmarinus officinalis*.

**Analyzed by:** Dr. Prabodh Satyal

**Reviewed by:** Ambika Poudel

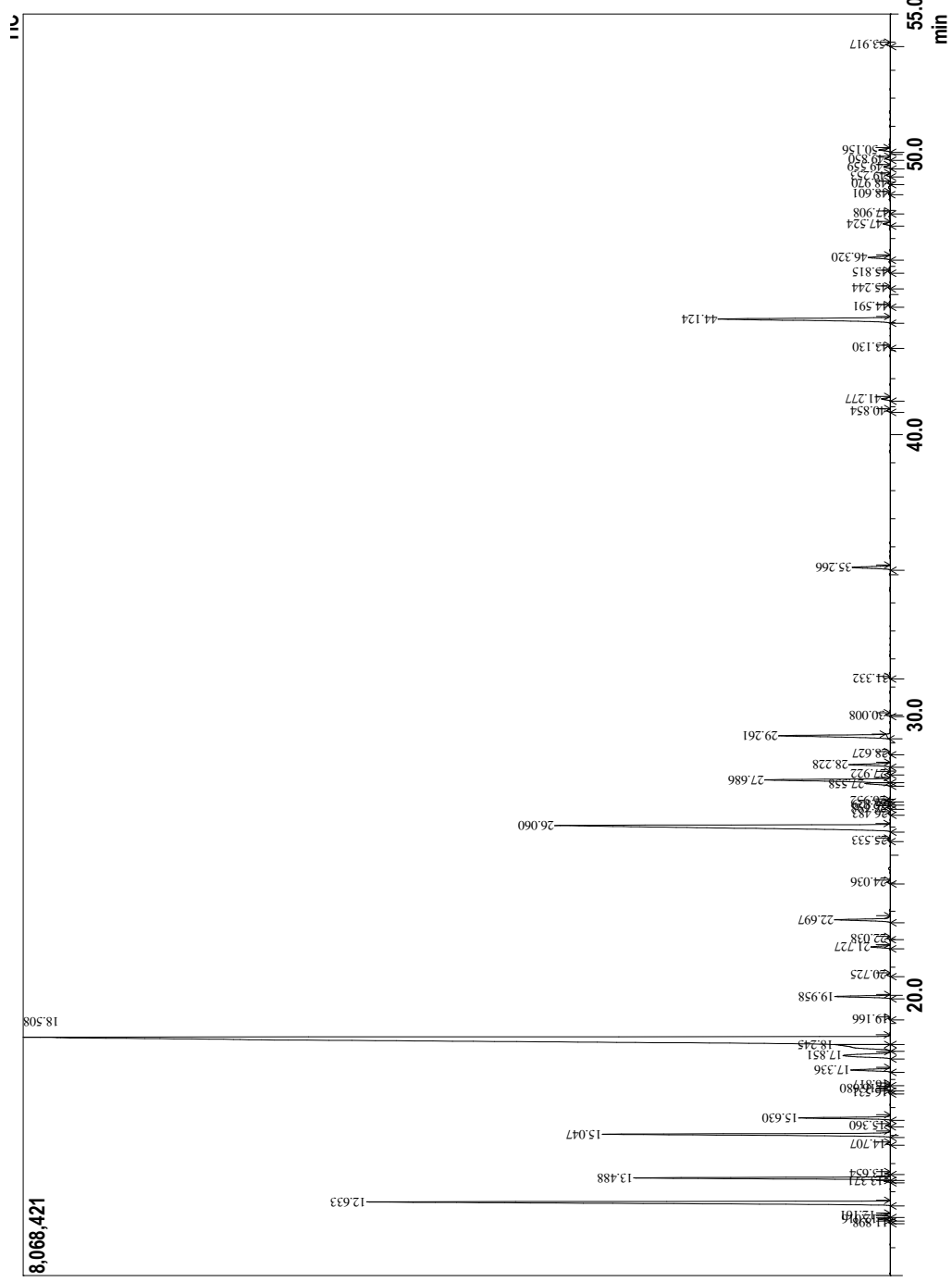
**Issued Date:** 4/5/2019

R.Time	Peak Name	Area%
11.898	Pinene isomer	0.02
12.016	Tricyclene	0.19
12.161	Thujene <alpha>	0.22
12.633	Pinene <alpha>	11.84
13.371	Fenchene <alpha>	0.09
13.488	Camphene	4.32
13.654	Thuja-2,4(10)dien	0.06
14.707	Sabinene	0.06
15.047	Pinene <beta>	5.60
15.360	3-Octanone	0.07
15.630	Myrcene	1.58
16.531	Pseudolimonene	0.03
16.680	Phellandrene <alpha>	0.24
16.817	Carene<delta-3->	0.02
17.336	Terpinene <alpha>	0.78
17.851	Cymene <para>	1.70
18.245	Limonene	2.16
18.508	1,8-cineole	42.50
19.166	Ocimene <E-beta>	0.02
19.958	Terpinene <gamma>	0.98
20.725	Sabinene hydrate <cis>	0.07
21.727	Terpinolene	0.35
22.038	Cymenene <para>	0.05
22.697	Linalool	1.14
24.036	Fenchol<endo->	0.06
25.533	Pinocarveol <trans->	0.04
26.060	Camphor	11.67
26.483	Camphene hydrate	0.04
26.698	Isopulegol	0.05
26.829	Pinocamphone<trans->	0.03
26.952	Pinocarvone	0.05
27.558	Terpineol <delta>	0.53
27.686	Borneol	3.03
27.922	Pinocamphone<cis->	0.06
28.228	Terpinen-4-ol	0.82
28.627	Cymen-8-ol<para->	0.03
29.261	Terpineol <alpha>	2.48
30.008	Verbenone	0.09
31.332	Citronellol	0.02
35.266	Bornyl acetate	0.83
40.854	Ylangene <alpha>	0.07
41.277	Copaene <alpha>	0.20
43.130	Caryophyllene <cis>	0.02
44.124	Caryophyllene <trans>	4.35
44.591	Ylangene <beta>	0.02
45.244	Atomadendrene	0.03
45.815	Geranyl acetone	0.03
46.320	Humulene <alpha>	0.49
47.524	Cadina-1(6),4-diene <trans>	0.16
47.908	Ar-Curcumen	0.01
48.601	Amorphene <gamma>	0.02
48.970	Muurolene <alpha>	0.05
49.253	Valencene	0.07
49.559	Bisabolene <beta>	0.13
49.850	Amorphene <delta>	0.11
50.156	Cadinene <delta>	0.24
53.917	Caryophyllene oxide	0.09
		100.00

Peak Report TIC

Sample Information

Analyzed by : Dr. Prabodh Satyal  
 Analyzed : 4/5/2019 8:28:38 AM  
 Sample Type : Essential Oil  
 Sample Name : Rosemary Rosmarinus Officinalis  
 Lot# : 13126R  
 Injection Volume : 0.30



# AROMATIC PLANT RESEARCH CENTER PHYSICAL CONSTANTS REPORT

**Oil Name:** Rosemary

**Botanical Name:** *Rosmarinus officinalis*

**Lot #:** 13126R

Organoleptic Information	
<b>Appearance</b>	Clear and mobile
<b>Color</b>	Pale yellow
<b>Odour</b>	Herbaceous and camphorous aroma

Physical Constants Information (at 20 °C)			
Tests	Observed	ISO Range	Comments
<b>Specific Gravity</b>	0.90809	*0.907 to 0.920	Meets ISO standards
<b>Refractive Index</b>	1.46697	* 1.464 to 1.470	Meets ISO standards
<b>Optical Rotation</b>	+1.16°	*-2° to +5°	Meets ISO standards

**Comments:**

\*ISO ranges are specifically for the Moroccan type Rosemary provided.

**Analyzed by:** Coraima Calderon  
**Reviewed by:** Ambika Poudel

**Date:** 4-8-19  
**Date:** 4-9-19



American College Of Healthcare Sciences

5940 SW Hood Ave
Portland, OR 97239

Client Sample ID: Rosemary essential oil lot 13126R
PAL Sample ID: P190571-01

Report Number: P190571
Report Date: April 25, 2019
Client Project ID:

Sample Date: 04/10/2019
Received Date: 04/15/2019
Extraction Date: 04/17/2019

Certificate of Analysis

Table with 10 columns: Analysis Date, Analyte, Amount Detected, LOQ (mg/kg), Notes, Analysis Date, Analyte, Amount Detected, LOQ (mg/kg), Notes. Includes a section for Modified EPA 8270D (GC-MS/MS) with multiple rows of pesticide data.

Handwritten signature of Rick Jordan



American College Of Healthcare Sciences

5940 SW Hood Ave  
Portland, OR 97239

Client Sample ID: Rosemary essential oil lot 13126R

PAL Sample ID: P190571-01

Report Number: P190571

Report Date: April 25, 2019

Client Project ID:

Sample Date: 04/10/2019

Received Date: 04/15/2019

Extraction Date: 04/17/2019

### Certificate of Analysis (Continued)

Analysis Date	Analyte	Amount Detected	LOQ (mg/kg)	Notes	Analysis Date	Analyte	Amount Detected	LOQ (mg/kg)	Notes
<b>Modified EPA 8270D (GC-MS/MS) (Continued)</b>									
04/18/2019	Oxadiazon	ND	0.50		04/18/2019	Oxyfluorfen	ND	0.50	
04/18/2019	p,p'-DDD	ND	0.50		04/18/2019	p,p'-DDE	ND	0.50	
04/18/2019	p,p'-DDT	ND	0.50		04/18/2019	Parathion-methyl	ND	0.50	
04/18/2019	PCA	ND	0.50		04/18/2019	PCB	ND	0.50	
04/18/2019	PCNB	ND	0.50		04/18/2019	Pendimethalin	ND	0.50	
04/18/2019	Pentachlorophenyl methyl sulfide	ND	0.50		04/18/2019	Permethrin	ND	2.5	
04/18/2019	Procymidone	ND	0.50		04/18/2019	Prodiamine	ND	0.50	
04/18/2019	Pronamide	ND	0.50		04/18/2019	Propachlor	ND	0.50	
04/18/2019	Pyriproxyfen	ND	0.50		04/18/2019	Quinoxifen	ND	0.50	
04/18/2019	Spirodiclofen	ND	0.50		04/18/2019	Tetraconazole	ND	0.50	
04/18/2019	Tetradifon	ND	0.50		04/18/2019	trans-Nonachlor	ND	0.50	
04/18/2019	Trifluralin	ND	0.50		04/18/2019	Vinclozalin	ND	0.50	
<b>Modified EPA 8321B (HPLC MS-MS)</b>									
04/20/2019	3-Hydroxycarbofuran	ND	0.50		04/18/2019	Abamectin	ND	0.50	
04/20/2019	Acephate	ND	0.50		04/18/2019	Acetamiprid	ND	0.50	
04/18/2019	Acibenzolar-S-methyl	ND	1.0		04/20/2019	Aldicarb	ND	0.50	
04/20/2019	Aldicarb Sulfone	ND	0.50		04/20/2019	Aldicarb Sulfoxide	ND	0.50	
04/20/2019	Allethrin	ND	0.50		04/20/2019	Ametoctradin	ND	0.50	
04/18/2019	Atrazine	ND	0.50		04/20/2019	Azinphos-ethyl	ND	0.50	
04/18/2019	Azinphos-methyl	ND	1.0		04/18/2019	Azoxystrobin	ND	0.50	
04/20/2019	Bendiocarb	ND	0.50		04/20/2019	Bensulide	ND	0.50	
04/18/2019	Bifenazate	ND	0.50		04/20/2019	Bitertanol	ND	0.50	
04/18/2019	Boscalid	ND	0.50		04/20/2019	Bromacil	ND	0.50	
04/18/2019	Carbaryl	ND	0.50		04/18/2019	Carbendazim	ND	0.50	
04/20/2019	Carbofuran	ND	0.50		04/18/2019	Carfentrazone-ethyl	ND	0.50	
04/18/2019	Chlorantraniliprole	ND	0.50		04/20/2019	Clethodim	ND	1.0	
04/18/2019	Clofentezine	ND	0.50		04/18/2019	Clothianidin	ND	0.50	
04/20/2019	Cyanazine	ND	0.50		04/18/2019	Cyantraniliprole	ND	0.50	
04/20/2019	Cyazofamid	ND	0.50		04/20/2019	Cycloate	ND	1.0	
04/18/2019	Cyflufenamid	ND	0.50		04/18/2019	Cyflumetofen	ND	0.50	
04/18/2019	Cymoxanil	ND	0.50		04/18/2019	Cyprodinil	ND	0.50	
04/20/2019	Cyromazine	ND	0.50		04/18/2019	DCPMU	ND	0.50	
04/20/2019	Diazoxon	ND	0.50		04/18/2019	Difenoconazole	ND	0.50	
04/18/2019	Diflubenzuron	ND	0.50		04/18/2019	Dimethoate	ND	0.50	
04/20/2019	Dimethomorph	ND	0.50		04/18/2019	Dinotefuran	ND	0.50	



American College Of Healthcare Sciences

5940 SW Hood Ave  
Portland, OR 97239

Client Sample ID: Rosemary essential oil lot 13126R

PAL Sample ID: P190571-01

Report Number: P190571

Report Date: April 25, 2019

Client Project ID:

Sample Date: 04/10/2019

Received Date: 04/15/2019

Extraction Date: 04/17/2019

Certificate of Analysis  
(Continued)

Analysis Date	Analyte	Amount Detected	LOQ (mg/kg)	Notes	Analysis Date	Analyte	Amount Detected	LOQ (mg/kg)	Notes
<b>Modified EPA 8321B (HPLC MS-MS) (Continued)</b>									
04/20/2019	Disulfoton sulfone	ND	0.50		04/18/2019	Diuron	ND	0.50	
04/18/2019	Dodine	ND	0.50		04/20/2019	d-Phenothrin	ND	0.50	
04/18/2019	Emamectin Benzoate	ND	0.50		04/20/2019	Ethion	ND	0.50	
04/18/2019	Famoxadone	ND	0.50		04/20/2019	Famphur	ND	0.50	
04/20/2019	Fenamidone	ND	0.50		04/20/2019	Fenamiphos sulfone	ND	0.50	
04/20/2019	Fenamiphos sulfoxide	ND	0.50		04/20/2019	Fenazaquin	ND	0.50	
04/18/2019	Fenbuconazole	ND	0.50		04/18/2019	Fenbutatin oxide	ND	0.50	
04/18/2019	Fenhexamid	ND	0.50		04/20/2019	Fenobucarb	ND	0.50	
04/18/2019	Fenpropathrin	ND	0.50		04/18/2019	Fenpyroximate	ND	0.50	
04/20/2019	Fenuron	ND	0.50		04/18/2019	Flonicamid	ND	0.50	
04/18/2019	Fluazinam	ND	0.50		04/18/2019	Flubendiamide	ND	1.0	
04/18/2019	Flumioxazin	ND	0.50		04/20/2019	Fluometuron	ND	0.50	
04/20/2019	Fluopicolide	ND	0.50		04/18/2019	Fluopyram	ND	0.50	
04/18/2019	Fluoxastrobin	ND	0.50		04/18/2019	Flupyradifurone	ND	0.50	
04/18/2019	Fluridone	ND	0.50		04/18/2019	Flutriafol	ND	0.50	
04/20/2019	Fluvalinate	ND	0.50		04/18/2019	Fluxapyroxad	ND	0.50	
04/20/2019	Fonofos	ND	1.0		04/18/2019	Formetanate HCl	ND	0.50	
04/20/2019	Hexaconazole	ND	0.50		04/18/2019	Hexazinone	ND	0.50	
04/18/2019	Hexythiazox	ND	0.50		04/18/2019	Imazalil	ND	0.50	
04/18/2019	Imidacloprid	ND	0.50		04/18/2019	Indaziflam	ND	0.50	
04/18/2019	Indoxacarb	ND	0.50		04/18/2019	Iprodione	ND	2.5	
04/18/2019	Isoxaben	ND	0.50		04/20/2019	Linuron	ND	0.50	
04/20/2019	Malaoxon	ND	0.50		04/20/2019	Mandipropamid	ND	0.50	
04/18/2019	Metconazole	ND	0.50		04/20/2019	Methamidophos	ND	1.0	
04/18/2019	Methidathion	ND	0.50		04/20/2019	Methiocarb	ND	0.50	
04/18/2019	Methomyl	ND	0.50		04/18/2019	Methoxyfenozide	ND	0.50	
04/18/2019	Metrafenone	ND	0.50		04/20/2019	Metribuzin	ND	0.50	
04/20/2019	Mevinphos	ND	0.50		04/18/2019	Norflurazon	ND	0.50	
04/18/2019	Novaluron	ND	0.50		04/20/2019	Omethoate	ND	0.50	
04/18/2019	Oryzalin	ND	0.50		04/20/2019	Oxadixyl	ND	0.50	
04/18/2019	Oxamyl	ND	0.50		04/18/2019	Oxydemeton-Methyl	ND	0.50	
04/18/2019	Penthiopyrad	ND	0.50		04/20/2019	Phorate Sulfone	ND	0.50	
04/20/2019	Phorate Sulfoxide	ND	0.50		04/20/2019	Phosalone	ND	0.50	
04/18/2019	Phosmet	ND	0.50		04/20/2019	Phosphamidon	ND	0.50	
04/18/2019	Piperonyl Butoxide	ND	0.50		04/20/2019	Pirimicarb	ND	0.50	
04/20/2019	Pirimiphos-methyl	ND	0.50		04/20/2019	Prometon	ND	0.50	



American College Of Healthcare Sciences

5940 SW Hood Ave  
Portland, OR 97239

Client Sample ID: Rosemary essential oil lot 13126R

PAL Sample ID: P190571-01

Report Number: P190571

Report Date: April 25, 2019

Client Project ID:

Sample Date: 04/10/2019

Received Date: 04/15/2019

Extraction Date: 04/17/2019

### Certificate of Analysis (Continued)

Analysis Date	Analyte	Amount Detected	LOQ (mg/kg)	Notes	Analysis Date	Analyte	Amount Detected	LOQ (mg/kg)	Notes
<b>Modified EPA 8321B (HPLC MS-MS) (Continued)</b>									
04/18/2019	Prometryn	ND	0.50		04/18/2019	Propargite	ND	0.50	
04/18/2019	Propazine	ND	0.50		04/18/2019	Propiconazole	ND	1.0	
04/18/2019	Prothioconazole	ND	1.0		04/18/2019	Pymetrozine	ND	0.50	
04/18/2019	Pyraclostrobin	ND	0.50		04/20/2019	Pyraflufen-ethyl	ND	0.50	
04/18/2019	Pyrethrin	ND	2.5		04/18/2019	Pyridaben	ND	0.50	
04/18/2019	Pyrimethanil	ND	0.50		04/18/2019	Rotenone	ND	0.50	
04/18/2019	Saflufenacil	ND	0.50		04/20/2019	Sethoxydim	ND	1.0	
04/20/2019	Siduron	ND	0.50		04/18/2019	Simazine	ND	0.50	
04/20/2019	Simetryn	ND	0.50		04/18/2019	Spinetoram	ND	0.50	
04/18/2019	Spinosad	ND	0.50		04/18/2019	Spiromesifen	ND	1.0	
04/18/2019	Spirotetramat	ND	0.50		04/20/2019	Spiroxamine	ND	0.50	
04/20/2019	Sulfentrazone	ND	0.50		04/18/2019	Sulfoxaflor	ND	0.50	
04/18/2019	Tebuconazole	ND	0.50		04/18/2019	Tebufenozide	ND	0.50	
04/20/2019	Tebuthiuron	ND	0.50		04/18/2019	Terbacil	ND	0.50	
04/20/2019	Terbuthylazine	ND	0.50		04/20/2019	Terbutryn	ND	0.50	
04/18/2019	Thiabendazole	ND	0.50		04/18/2019	Thiacloprid	ND	0.50	
04/18/2019	Thiamethoxam	ND	0.50		04/20/2019	Thiobencarb	ND	0.50	
04/20/2019	Thiodicarb	ND	0.50		04/18/2019	Thiophanate methyl	ND	0.50	
04/18/2019	Tolfenpyrad	ND	0.50		04/18/2019	Triadimefon	ND	0.50	
04/18/2019	Triadimenol	ND	1.0		04/18/2019	Trifloxystrobin	ND	0.50	
04/18/2019	Triflumizole	ND	0.50						

### Notes and Definitions

Notes	Definition
LOQ	Limit of Quantitation
ND	Not Detected
*	Not included under current scope of accreditation

The results contained in this report relate only to the items tested.  
 The results reflect the condition of the samples as received by PAL.  
 Samples will be stored for a minimum of 60 days after the final report is issued, as described in our Quality Manual.  
 Reports should not be reproduced, except in full, without written approval from PAL.  
 PAL is accredited to ISO/IEC 17025:2017 Standard, by PJLA, Accreditation #64422, Testing.