APPENDICES

APPENDIX A : CALCULATION ABUOT ANTIOXIDATION ACTIVITY

1. Wine samples preparation for antioxidation activity.

- Preparation of 0.5 % v/v of wine sample 25mL

Final solution volume 100 mL, use wine sample 0.5 mL

Final solution volume 25 mL, use wine sample $\frac{0.5\text{mL} \times 25\text{mL}}{100\text{mL}}$ mL

$= 0.125\text{mL}$

0.125mL of each wine sample were diluted with water to 25mL solution

Other concentration of wine sample to antioxidation activity analysis (1, 3, 5, 7 and 9%v/v) will use same calculation method and pipette the 0.25mL, 0.75mL, 1.25mL and 2.25mL of each wine respectively and dilute to final volume of 25mL

2. DPPH solution preparation

DPPH solution was prepared in 6.5×10^{-5} M , 100 mL (Mw of DPPH is 394.33g/mol)

From $g = \frac{(M)(Mw)(V_{mL})}{10P}$

While g = gram of DPPH

M = concentration

Mw = molecular weight

V_{mL} = Volume of solution

P = purity of DPPH (%)

Replace the variable with the value

$g = \frac{(6.5\text{x}10^{-5})(394.33)(100)}{10(99.8)}$

$g = 0.0026$ g

0.0026 g of DPPH was dissolved in methanol and adjusted the final volume to 100 mL

3. Calculation of absorbance reduce percentage of DPPH

From the equation

$$\text{Percentage of radical inhibition} = \frac{A_{blank} - A_{sample}}{A_{blank}} \times 100$$

For example, from table the absorbance at 517 nm for antioxidant activity test of Longan wood aged wine.

Wine sample conc. (%v/v)	A_{517}		
	1	2	3
0	0.2037	0.2037	0.2037
0.5	0.0552	0.0557	0.0555
1	0.0967	0.0969	0.0961
3	0.1136	0.1136	0.1137
5	0.1287	0.1294	0.1291
7	0.1433	0.1434	0.1433
9	0.1619	0.1621	0.1620

Absorbance of blank (no sample, only methanol and DPPH solution) was 0.2037. At 0.5% v/v of wine sample after react with DPPH solution the absorbance was 0.0552. Replace both value in the equation above.

$$\text{Percentage of radical inhibition} = \frac{0.2037 - 0.0552}{0.2037} \times 100$$

$$= 72.90\ \%$$

Other concentration and other wine samples would calculate as same method.

APPENDIX B : Wine Tasting table form and Tasting score result

I) Table form (Pradit Kuruwanna)

ชื่อ-สกุล...โทรศัพท์...............................

ผู้ร่วมทดสอบมีประสบการณ์เกี่ยวกับการดื่มไวน์หรือไม่ ☐มี ☐ไม่มี

ถ้ามีความถี่ในการดื่ม ☐ทุกวัน ☐สัปดาห์ละครั้ง ☐เดือนละครั้ง ☐เฉพาะโอกาสพิเศษ

คำชี้แจง

ให้ผู้ร่วมทดสอบทำการทดสอบกลิ่นและรสของน้ำตัวอย่างหมายเลขต่างๆ โดยใช้การดมกลิ่น และชิมรส จากนั้นให้คะแนนตามความรู้สึกและกลิ่นรสที่สัมผัสได้ตามคุณสมบัติต่างๆ (มีคำอธิบายคุณสมบัติต่างๆด้านหลังครับ)

คุณสมบัติ	คะแนนสูงสุดไม่เกิน	คะแนนที่ได้จากการชิม น้ำตัวอย่างหมายเลขต่างๆ																	
		216	417	172	786	824	984	361	882	538	551	784	957	641	684	585	646	653	128
ความใส	2																		
สี	2																		
กลิ่น	4																		
กลิ่นน้ำส้มสายชู	2																		
กรดทั้งหมด(ความเปรี้ยว)	2																		
ความหวาน	1																		
เนื้อหนัง(Texture)	1																		
รส	2																		
ความเฝื่อน	2																		
คุณภาพโดยทั่วไป	2																		
คะแนนรวม	20																		

ความเห็นเพิ่มเติม

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II) Sample of table after the volunteer evaluated the tast of wine

ชื่อ-สกุล ณัฐพล ตะนันธ์ **โทรศัพท์** 090-1328960

ผู้ร่วมทดสอบมีประสบการณ์เกี่ยวกับการดื่มไวน์หรือไม่ ☐มี ☐ไม่มี

ถ้ามีความถี่ในการดื่ม ☐ทุกวัน ☐สัปดาห์ละครั้ง ☐เดือนละครั้ง ☐เฉพาะโอกาสพิเศษ

คำชี้แจง

ให้ผู้ร่วมทดสอบทำการทดสอบกลิ่นและรสของน้ำตัวอย่างหมายเลขต่างๆ โดยใช้การดมกลิ่น และชิมรส จากนั้นให้คะแนนตามความรู้สึกและกลิ่นรสที่สัมผัสได้ตามคุณสมบัติต่างๆ (มีคำอธิบายคุณสมบัติต่างๆด้านหลังครับ)

คุณสมบัติ	คะแนนสูงสุดไม่เกิน	คะแนนที่ได้จากการชิม น้ำตัวอย่างหมายเลขต่างๆ																	
		216	417	172	786	824	984	361	882	538	551	784	957	641	684	585	646	653	128
ความใส	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
สี	2	2	1	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2
กลิ่น	4	3	2	3	3	2	4	3	3	3	3	2	3	4	2	3	3	2	4
กลิ่นน้ำส้มสายชู	2	2	1	2	2	1	1	2	2	2	2	2	2	2	2	2	1	2	2
กรดทั้งหมด(ความเปรี้ยว)	2	1	2	2	1	2	2	2	1	1	1	2	1	2	2	1	1	1	1
ความหวาน	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1
เนื้อหนัง(Texture)	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
รส	2	2	2	2	2	2	1	2	1	2	1	1	2	2	2	2	2	2	2
ความเฝื่อน	2	2	1	1	1	1	2	2	1	1	1	1	1	2	1	2	1	1	2
คุณภาพโดยทั่วไป	2	2	1	2	2	1	2	2	2	2	1	1	2	2	1	2	2	1	2
คะแนนรวม	20	18	14	18	16	15	17	19	15	16	15	15	17	20	16	18	16	15	19

ความเห็นเพิ่มเติม

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III) Wine samples evaluation score.

Volunteer	Longan	Luna nut	Drumstick	Neem	Black poum	Oak
1	18.67	14.33	18.00	15.33	14.67	17.67
2	19.00	15.00	17.00	15.33	15.00	17.33
3	19.00	15.00	18.33	15.33	14.67	17.33
4	18.67	14.33	18.00	15.00	14.00	17.67
5	17.67	13.33	17.00	14.67	13.67	17.33
6	19.00	15.00	17.33	15.67	15.00	17.67
7	18.67	16.00	17.67	14.67	15.00	18.00
8	17.67	14.00	17.33	15.67	14.67	17.00
9	18.33	16.00	17.67	15.00	14.67	18.00
10	18.67	14.67	18.00	15.00	14.67	18.00
11	19.00	14.67	17.67	15.33	14.67	17.00
12	18.67	15.00	17.00	15.00	14.67	18.00
13	17.67	15.00	18.33	15.67	14.67	18.00
14	18.33	16.00	18.00	15.00	14.67	18.00
15	18.33	14.00	18.00	15.00	14.67	17.33
16	18.67	16.00	17.67	15.00	14.67	17.67
17	19.00	14.67	17.67	15.33	14.00	17.33
18	19.00	15.00	18.00	15.67	14.67	17.67
19	18.67	14.33	17.67	14.67	14.67	17.00
20	17.67	14.00	18.00	15.67	14.67	18.00
21	18.33	16.00	18.00	15.00	15.00	17.33
22	18.67	16.00	17.67	15.00	15.00	17.67
23	19.00	14.67	17.67	15.33	14.67	17.00
24	18.67	16.00	17.00	15.00	14.67	18.00
25	17.67	14.67	18.33	15.67	14.00	18.00
26	18.33	15.00	17.33	15.00	14.67	18.00
27	18.33	14.33	18.33	15.00	14.67	17.33
28	18.67	14.00	18.00	15.00	14.67	17.67
29	18.33	14.67	17.67	15.00	14.67	18.00
30	18.67	15.00	17.00	15.00	14.67	17.00

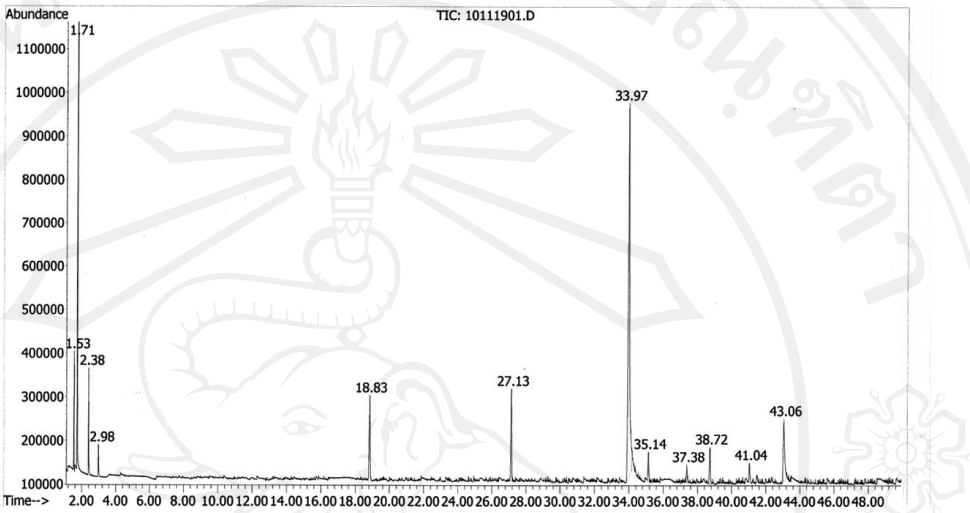
Volunteer	Longan	Luna nut	Drumstick	Neem	Black poum	Oak
31	19.00	15.00	18.33	15.33	15.00	18.00
32	18.67	16.00	18.00	15.00	14.67	18.00
33	17.67	14.00	18.00	15.67	14.00	17.33
34	18.67	16.00	17.67	15.00	14.67	17.67
35	19.00	14.33	17.67	15.33	14.67	17.00
36	19.00	14.00	17.00	15.67	14.67	18.00
37	18.67	16.00	18.33	14.67	14.00	18.00
38	17.67	16.00	17.00	15.67	14.67	18.00
39	18.33	14.67	17.67	15.00	14.67	18.00
40	18.67	15.00	17.00	15.00	14.67	18.00
41	17.67	15.00	18.33	15.67	14.67	17.33
42	18.33	15.00	18.00	15.00	14.67	17.67
43	18.33	14.33	18.00	15.00	15.00	17.00
44	18.67	14.00	17.00	15.00	15.00	18.00
45	19.00	16.00	18.33	15.33	14.67	17.33
46	19.00	15.00	17.33	15.67	14.67	17.67
47	19.00	14.33	17.67	15.33	14.67	18.00
48	18.67	14.00	18.00	15.00	14.67	17.00
49	17.67	16.00	18.00	15.67	14.00	18.00
50	18.33	16.00	17.67	15.00	14.67	17.67
Average	18.50	14.95	17.73	15.20	14.62	17.63
SD	0.46	0.76	0.44	0.32	0.30	0.38

APPENDIX C : TIC CROMATOGRAM

Symbol in field Sample Name

LY	=	Longan wood aged wine
MRM	=	Drumstick wood aged wine
MT	=	Luna nut wood aged wine
SLM	=	Neem wood aged wine
WA	=	Black poum wood aged wine
OAK	=	Oak wood aged wine

File :D:\GCMS\2010\10111901.D
Operator : Pisan
Acquired : 19 Nov 2010 10:58 using AcqMethod PASU.M
Instrument : Instrument #1
Sample Name: LY
Misc Info : 100 um PDMS RT 30 min
Vial Number: 1



Area Percent Report

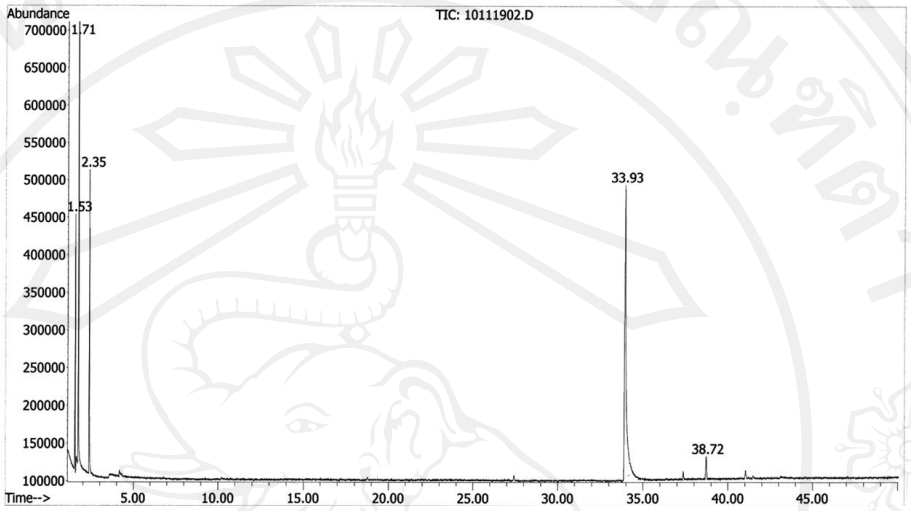
Method : C:\MSDCHEM\1\METHODS\PK1010.M
Title : citrinin

Signal : TIC

peak #	R.T. min	first scan	max scan	last scan	PK TY	peak height	corr. area	corr. % max.	% of total
1	1.529	87	96	105	BV	271704	3649407	7.18%	3.293%
2	1.711	126	135	169	BV	1656830	20403658	40.17%	18.412%
3	2.381	270	279	307	BV	250935	3832855	7.55%	3.459%
4	2.977	394	407	431	BB	74310	1418816	2.79%	1.280%
5	18.824	3791	3811	3838	BV 2	193855	7007023	13.80%	6.323%
6	27.133	5576	5596	5611	PV	210785	6923956	13.63%	6.248%
7	33.967	7031	7064	7105	BV 2	858927	50793790	100.00%	45.836%
8	35.140	7298	7316	7334	BV 2	67440	2239862	4.41%	2.021%
9	37.380	7783	7797	7817	VV 4	39648	1349724	2.66%	1.218%
10	38.720	8066	8085	8108	PV 4	83708	3347339	6.59%	3.021%
11	41.039	8559	8583	8603	BV 4	43574	1698058	3.34%	1.532%
12	43.059	8985	9017	9055	BV	141167	8153036	16.05%	7.357%

Sum of corrected areas: 110817523

File :D:\GCMS\2010\10111902.D
Operator : Pisan
Acquired : 19 Nov 2010 14:43 using AcqMethod Pasu.M
Instrument : Instrument #1
Sample Name: MT
Misc Info : 100 um PDMS RT 30 min
Vial Number: 1



Area Percent Report

Method : C:\MSDCHEM\1\METHODS\PK1010.M
Title : citrinin

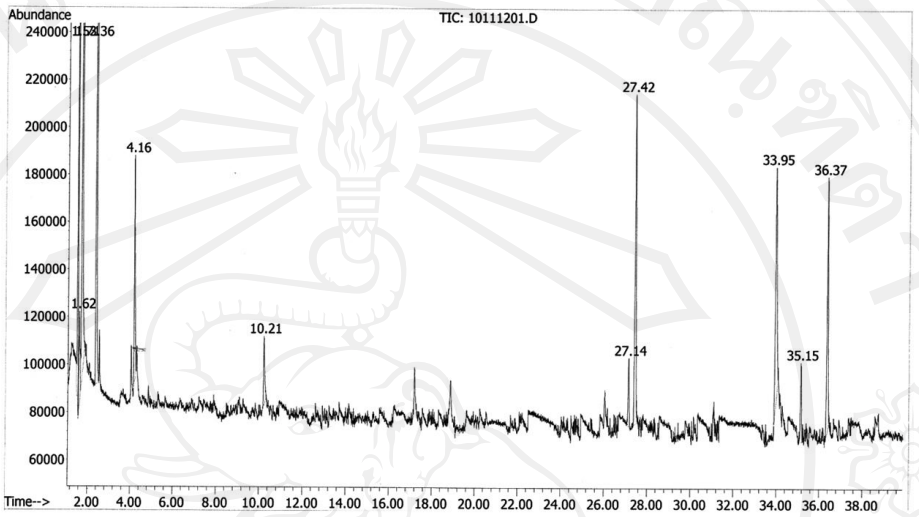
Signal : TIC

peak #	R.T. min	first scan	max scan	last scan	PK TY	peak height	corr. area	corr. % max.	% of total
1	1.529	84	96	105	BV	344635	4670887	18.75%	8.358%
2	1.711	128	135	175	BV	1539839	19267073	77.35%	34.476%
3	2.353	265	273	305	BV	389556	5931642	23.81%	10.614%
4	33.930	7017	7056	7155	BV 2	388938	24909698	100.00%	44.572%
5	38.720	8052	8085	8097	BV 6	29892	1106549	4.44%	1.980%

Sum of corrected areas: 55885849

PK1010.M Fri Nov 26 16:25:30 2010

File :D:\GCMS\2010\10111201.D
Operator : Pisan
Acquired : 12 Nov 2010 11:51 using AcqMethod PASU.M
Instrument : Instrument #1
Sample Name: MRM
Misc Info : 100 um PDMS RT 30 min
Vial Number: 1



Area Percent Report

Method : C:\MSDCHEM\1\METHODS\LL1011_ION.M
Title : L-Lactide

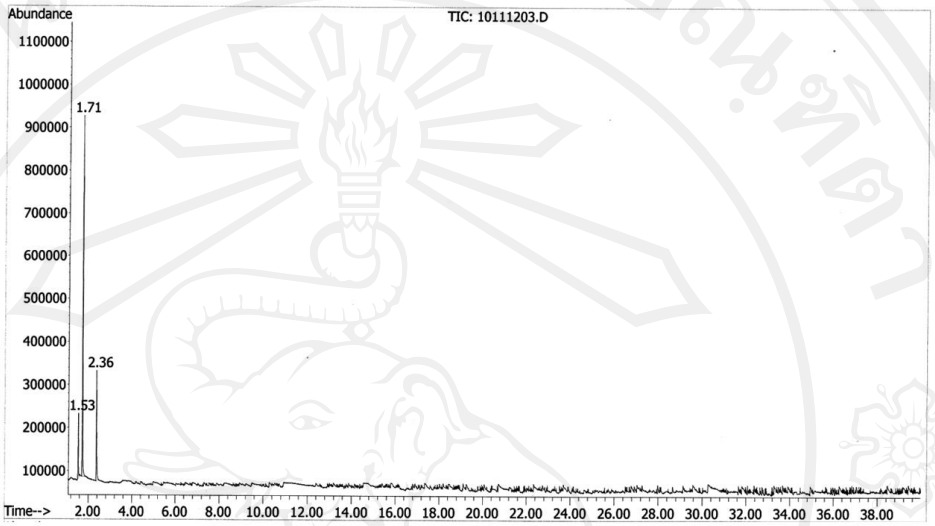
Signal : TIC

peak #	R.T. min	first scan	max scan	last scan	PK TY	peak height	corr. area	corr. % max.	% of total
1	1.529	86	96	105	VV	449040	7039382	13.83%	6.184%
2	1.617	105	115	122	PV 2	39804	1167048	2.29%	1.025%
3	1.711	128	135	167	VV	3378518	50893819	100.00%	44.707%
4	2.367	270	276	309	BV	2351682	35305447	69.37%	31.014%
5	4.159	650	661	684	PV 2	101061	2477035	4.87%	2.176%
6	10.216	1940	1962	1984	BV 4	28847	978468	1.92%	0.860%
7	27.138	5580	5597	5613	BV 3	28643	947265	1.86%	0.832%
8	27.422	5641	5658	5688	BV 2	138900	5125782	10.07%	4.503%
9	33.953	7032	7061	7088	BV 4	101606	4817091	9.46%	4.232%
10	35.150	7301	7318	7335	PV 2	32812	1124800	2.21%	0.988%
11	36.369	7565	7580	7600	PV 4	107921	3962272	7.79%	3.481%

Sum of corrected areas: 113838409

_L1011_ION.M Tue Nov 16 15:36:04 2010

File :D:\GCMS\2010\10111203.D
Operator : Pisan
Acquired : 12 Nov 2010 15:31 using AcqMethod PASU.M
Instrument : Instrument #1
Sample Name: SLM
Misc Info : 100 um PDMS RT 30 min
Vial Number: 1



Area Percent Report

Method : C:\MSDCHEM\1\METHODS\LL1011_ION.M
Title : L-Lactide

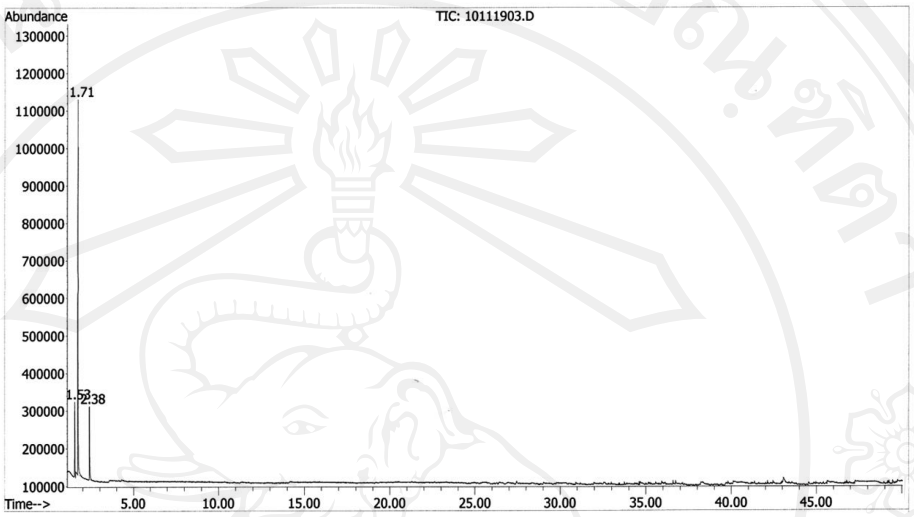
Signal : TIC

peak #	R.T. min	first scan	max scan	last scan	PK TY	peak height	corr. area	corr. % max.	% of total
1	1.534	89	97	106	BV	149662	1993098	19.26%	12.301%
2	1.715	124	136	164	BV	836026	10349421	100.00%	63.874%
3	2.362	270	275	308	BB	255266	3860356	37.30%	23.825%

Sum of corrected areas: 16202875

LL1011_ION.M Tue Nov 16 15:47:16 2010

File :D:\GCMS\2010\10111903.D
Operator : Pisan
Acquired : 19 Nov 2010 16:14 using AcqMethod Pasu.M
Instrument : Instrument #1
Sample Name: WA
Misc Info : 100 um PDMS RT 30 min
Vial Number: 1



Area Percent Report

Method : C:\MSDCHEM\1\METHODS\PK1010.M
Title : citrinin

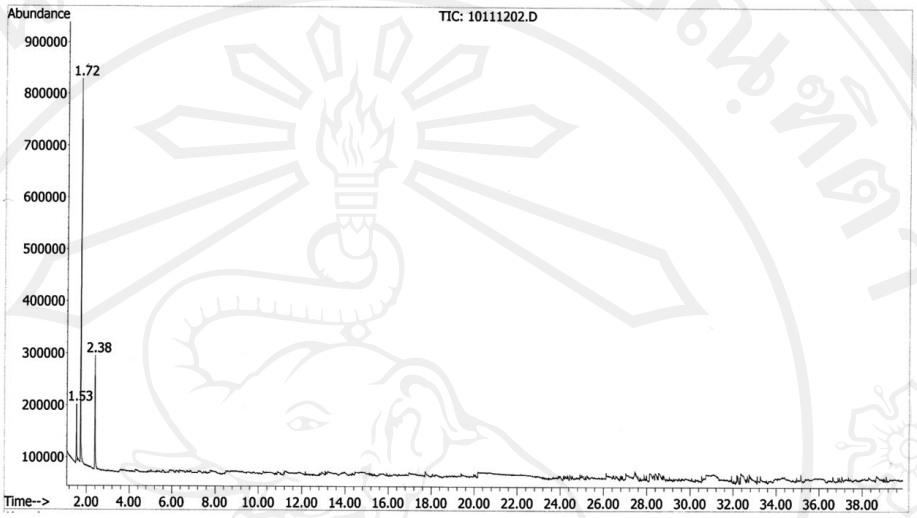
Signal : TIC

peak #	R.T. min	first scan	max scan	last scan	PK TY	peak height	corr. area	corr. % max.	% of total
1	1.529	81	96	105	BV	195153	2660936	21.12%	14.293%
2	1.711	124	135	180	BV	984066	12598923	100.00%	67.674%
3	2.381	269	279	316	BB	199703	3357122	26.65%	18.033%

Sum of corrected areas: 18616981

PK1010.M Fri Nov 26 16:26:48 2010

File :D:\GCMS\2010\10111202.D
Operator : Pisan
Acquired : 12 Nov 2010 14:07 using AcqMethod PASU.M
Instrument : Instrument #1
Sample Name: OAK
Misc Info : 100 um PDMS RT 30 min
Vial Number: 1



Area Percent Report

Method : C:\MSDCHEM\1\METHODS\LL1011_ION.M
Title : L-Lactide

Signal : TIC

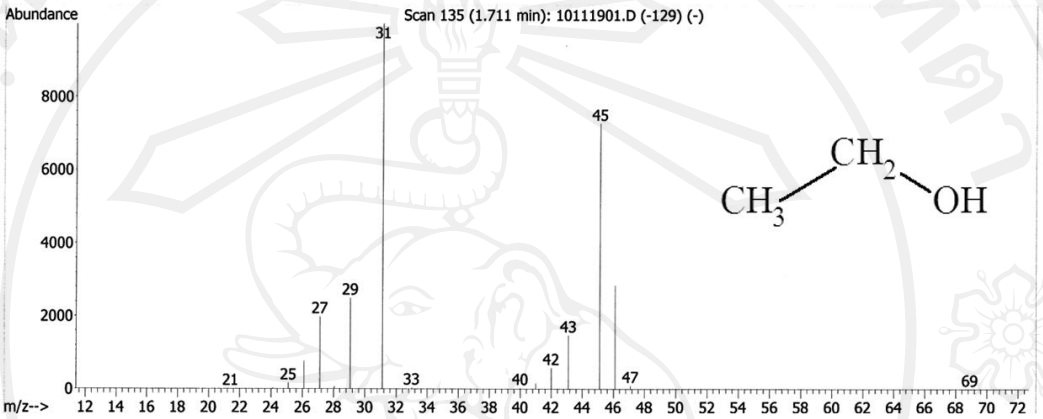
peak #	R.T. min	first scan	max scan	last scan	PK TY	peak height	corr. area	corr. % max.	% of total
1	1.534	75	97	106	BV	109123	1336200	15.42%	10.063%
2	1.715	125	136	166	BB	715516	8666333	100.00%	65.265%
3	2.386	272	280	305	BV	216840	3276079	37.80%	24.672%

Sum of corrected areas: 13278612

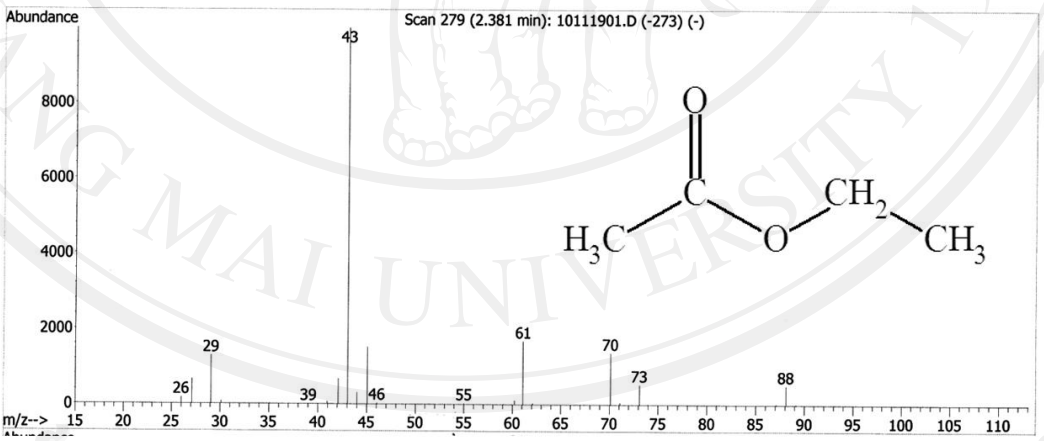
LL1011_ION.M Tue Nov 16 15:41:03 2010

APPENDIX D : MASS SPECTRA OF INTERESTED VOLATILE COMPOUND

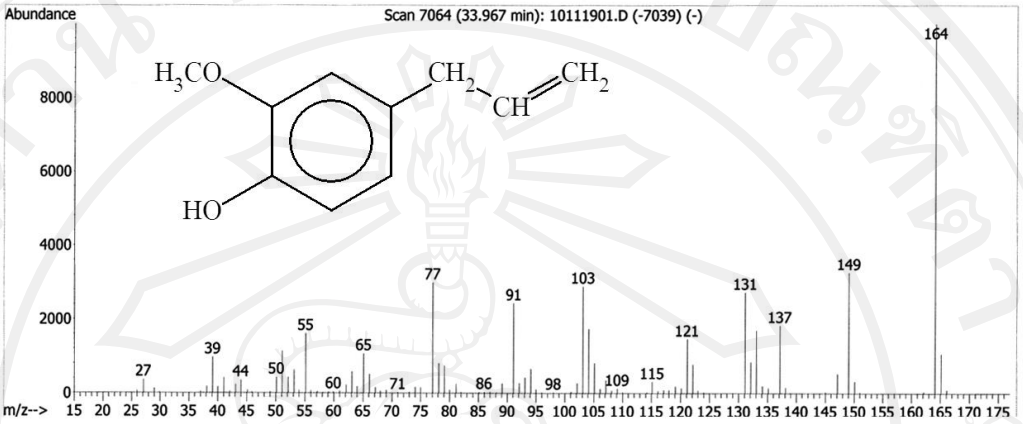
Library Searched : C:\Database\wiley7n.l
Quality : 90
ID : Ethanol (CAS) $$ Ethyl alcohol $$ EtOH $$ Tecsol $$ Jaysol $$ Alcohol $$ Algrain $$ Anhydrol $$ Jaysol S $$ Ethyl alc $$ Thanol $$ Ethyl hydrate $$ Methylcarbinol $$ Ethyl hydroxide $$ Alcohol anhydrous $$ Denatured ethanol $$ SD Alchol 23-hydrogen $$ Tec



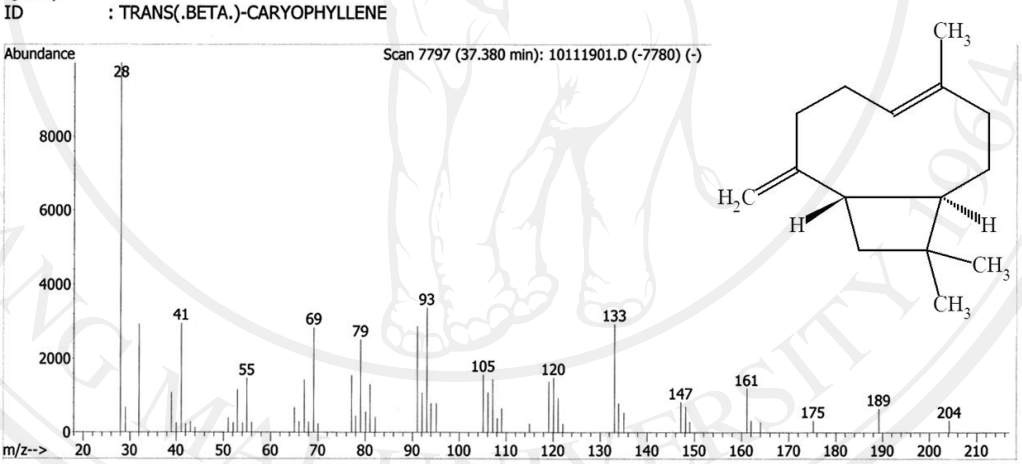
Library Searched : C:\Database\wiley7n.l
Quality : 87
ID : Ethyl Acetate



Library Searched : C:\Database\wiley7n.l
Quality : 98
ID : Phenol, 2-methoxy-3-(2-propenyl)-



Library Searched : C:\Database\wiley7n.l
Quality : 99
ID : TRANS(.BETA.)-CARYOPHYLLENE



Library Searched : C:\Database\wiley7n.l
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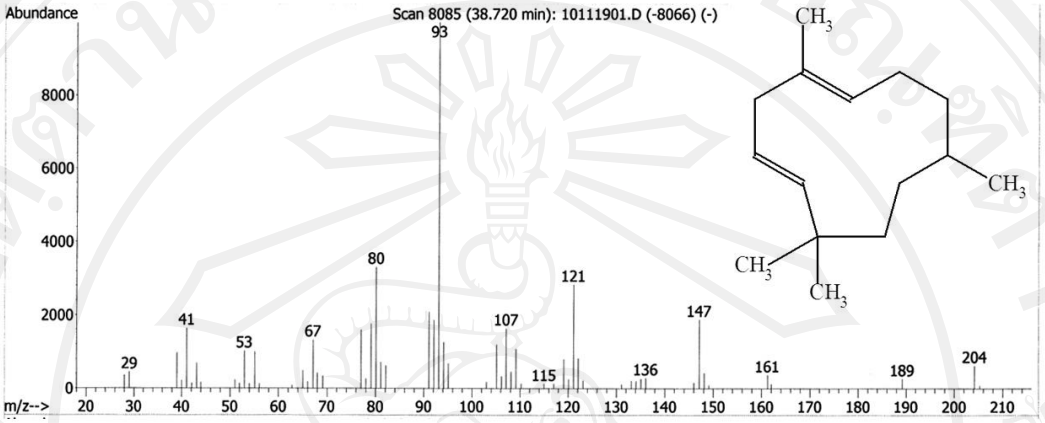
NE, 1,1,4,8-TETRAMETHYL-, ALL-CIS $$ Humulene $$ .alpha.-Caryophyllene $$ ALPHA-HUMULENE $$ Cycloundec
,8-triene,2,6,6,9-tetramethyl- $$ ALPHA-H



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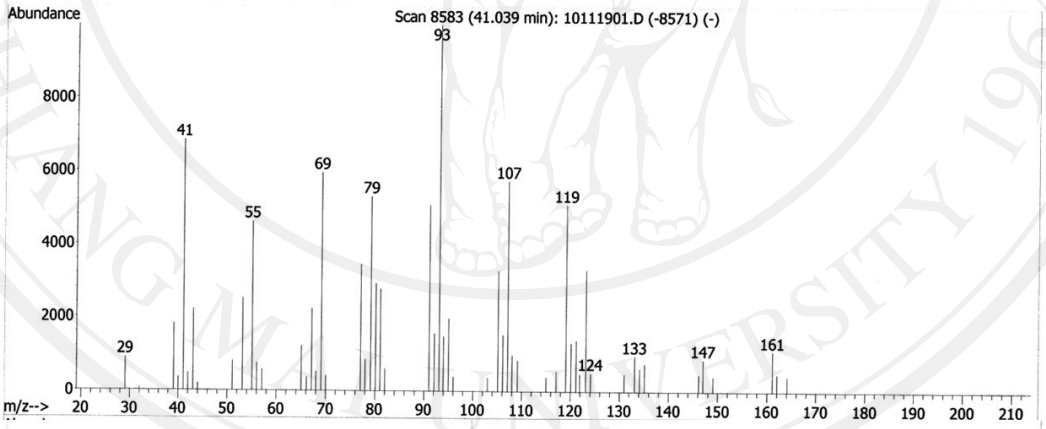
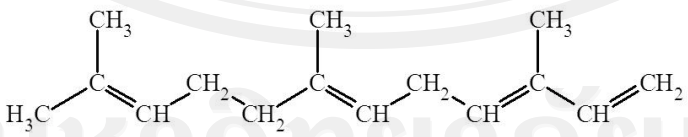
odecatetraene $$ 3,7,11-Trimethyl-1,3,6,10-dodecatetraene $$ 1,3,6,10-Dodecatetraene, 3,7,11-trimethyl-, (E
,E)-





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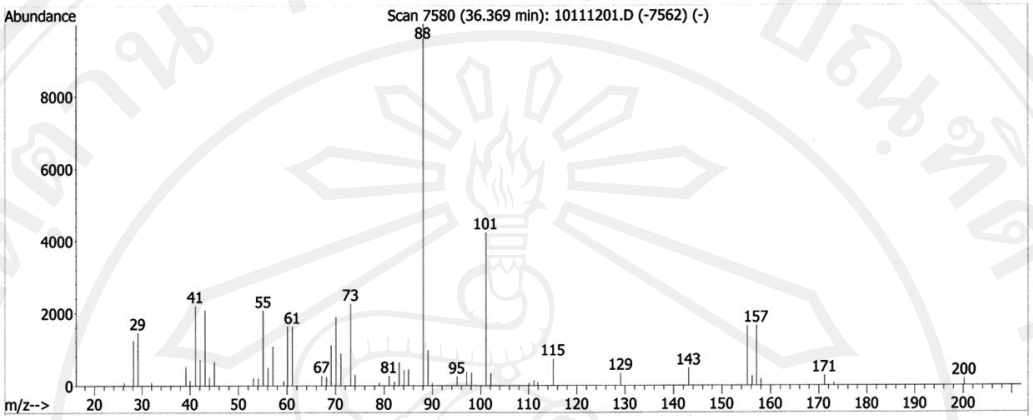

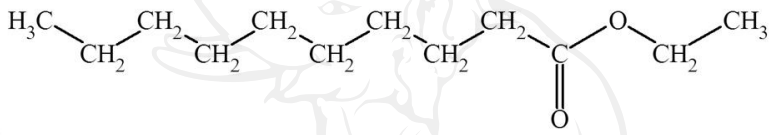

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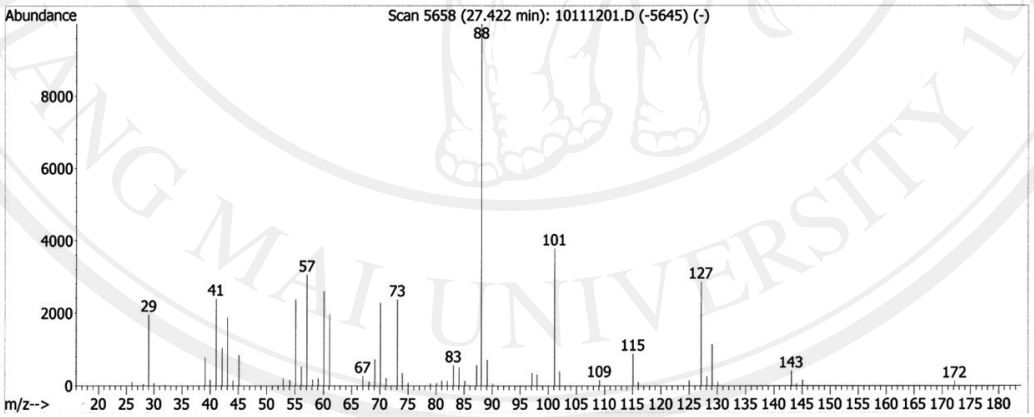
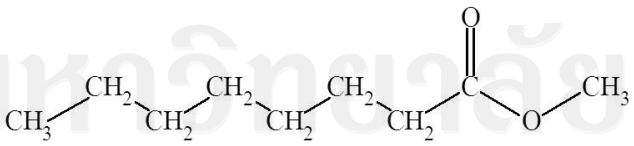




APPENDIX E : TRAINING PROCEDURE

I. Volunteers training

a) Sample preparation

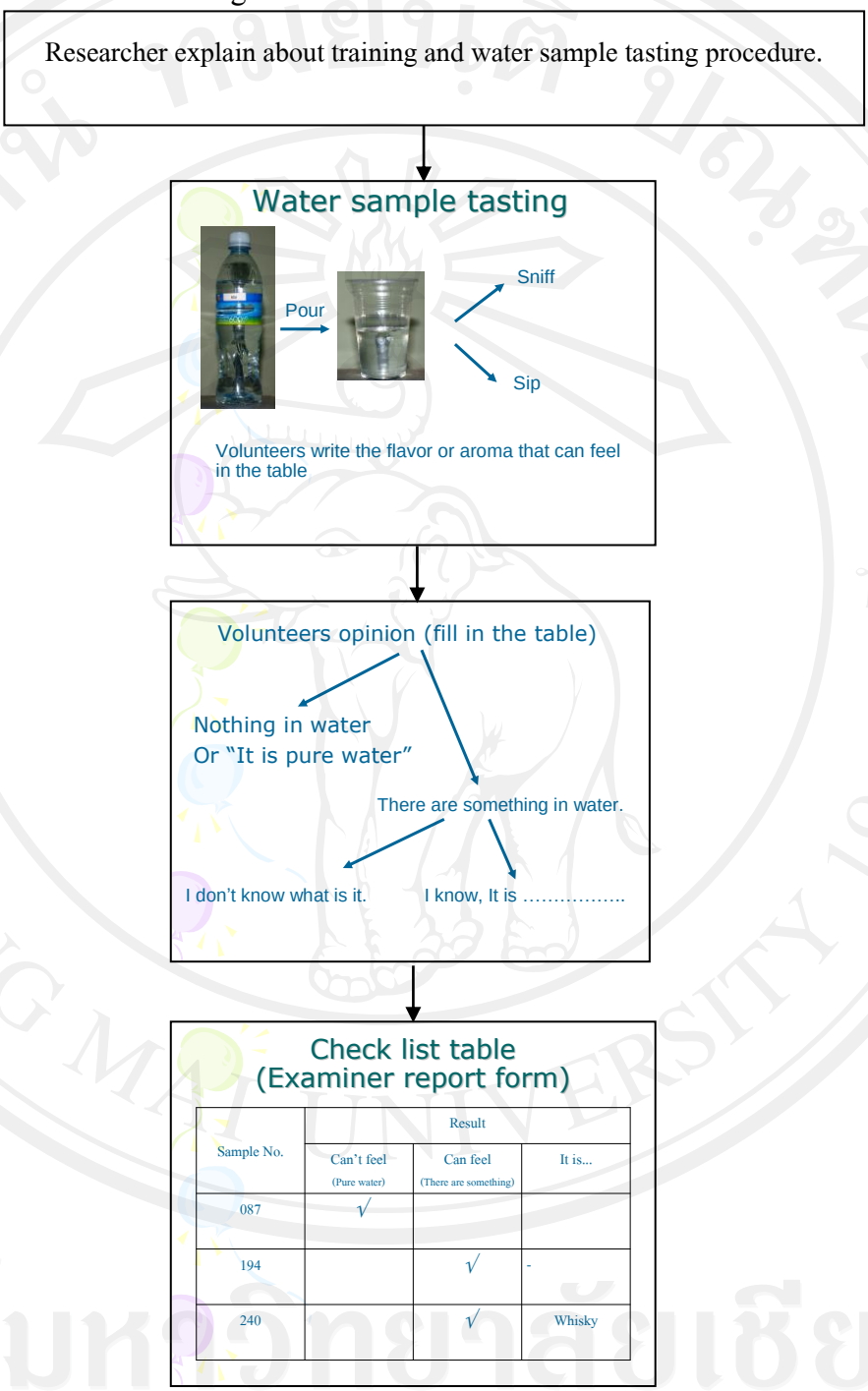
Chemical substance	**Vegetable and Fruit**	**Food and Brewerage**
ethanol, acetaldehyde, acetic acid and ethyl acetate	rose, spinach, grape, jasmine pickle, pine apple, garlic, paper and passion fruit	wine, oxidized wine, yogurt, brandy, coffee
- Pipette 1.0 mL of substance and adjust the volume to 1,000 with water.	- Crushing and weight 1.0 g filtering and dulute to 100 mL with water.	- Pittete 10 mL and adjust the volume to 1000 mL

Fill the each water samples in the bottle separately and labeled the number on the bottles.

* Sulphur dioxide odor, use the mineral water from Sankampaeng hot spring, Chiang Mai, Thailand.

Volunteers training

b) Volunteer Training



After water sample tasting, each sample bottles were replied and volunteers must tasting the water sample again.

APPENDIX F : PICTURE RELATE IN THIS WORK

Wood chip preparation

Wood log

Slice and cut to small chip

Roast for 30 min

Roasted wood chip

Wine sample evaluation taste.

Aged wine sample bottle.

Laid the bottle on the table.

Volunteer tasting.

CURRICULUM VITAE

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Education

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3. Lecturer, Chiang Mai Rajabhat University, Chiang Mai,Thailand (2002 – Today)
4. Assistant Dean and Leader of Science center, Faculty of Science and Technology, Chiang Mai Rajabhat University, Chiang Mai, Thailand (2006-2007)