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	PROSEDUR PENGENDALIAN	Dokumen No.	AK/JK.P/A/01
	PERALATAN GC FID BAGI ANALISIS	Tarikh Semakan	AK/JK.P/A/01 <kosongkan></kosongkan>
	SAMPEL	Mukasurat:	1 daripada 13

1. TUJUAN

Tujuan prosedur ini dtubuhkan adalah untuk memberikan arahan yang jelas bagi langkah atau tatacara bagaimana menjalankan analisis sampel menggunakan peralatan *Gas Chromatography Flame Ionization Detector (GC FID).*

2. SKOP

Terpakai untuk pengguna dari Jabatan Kimia.

3. PROSEDUR ARAHAN

A. Pemasangan Column

- 3.1 Masukkan septum, nut & ferrule di kedua-dua hujung column.
 - 3.1.1 Kedua-dua hujung *column* dipotong menggunakan pembaris yang disediakan dengan anggaran < 10mm.
 - 3.1.2 Hujung *column* yang bersambung dengan *injector* dipasang dengan anggaran < 10mm (dicadangkan 4mm 6mm).



3.1.3 Hujung *column* yang bersambung dengan *detector* dipasang hingga ke penghujung dan ditarik sedikit ke bawah dengan anggaran 1mm – 2mm sebelum diketatkan.



3.1.4 Ketatkan kedua-dua *nut* dengan menggunakan spanar yang bersesuaian.



B. Buka Injap Gas

- Buka injap gas Pemampat Nitrogen, Pemampat Udara dan Pemampat Hidrogen. 3.2
 - 3.2.1 Pastikan gas mencukupi seperti yang dicadangkan :-

Pemampat Nitrogen	: 400 kPa (60 psi) atau maksimum 690 kPa (100 psi)
Pemampat Udara	: 550 kPa (80 psi) atau maksimum 690 kPa (100 psi)
Pemampat Hidrogen	: 400 kPa (60 psi) atau maksimum 690 kPa (100 psi)

C. Hidupkan Sistem

- 3.3 Hidupkan suis Gas Chromatography dan komputer.
 - Masukkan katalaluan di komputer : ********** 3.3.1
 - 3.3.2 Pada desktop Windows, klik Instrument 1 Online



D. Pemasangan Syringe

3.4 Pastikan sambungan wayar pada autoinjector cable port.



3.4.1 Cucuk bahagian Alignment button menggunakan objek halus & tajam seperti jarum dan hold sehingga lampu Ready bewarna hijau.



3.4.2 Buka pintu syringe carriage dan pasang syringe serta ketatkan plunger screw (hand tight).



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- 3.4.3 Kunci *syringe* dengan menolak ke kanan *syringe latch*.
- 3.4.4 Tutup pintu *syringe carriage*.

E. Wujudkan Kaedah Baru

3.5 Klik Method dan pilih New Method



3.5.1 Klik sekali lagi *Method* dan pilih *Edit Entire Method*...



3.5.2 Klik OK pada *Edit Method* : Instrument 1 (Rajah 1) dan OK pada Method Information Instrument 1 (Rajah 2).



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3.5.3 Pilih GC Injector pada Select Injection Source/Location dan klik OK



F. Maklumat Kaedah

3.6 Klik Oven Temp On dan masukkan maklumat suhu oven.



3.6.1 Klik tab ALS dan masukkan maklumat pada tab Front Injector



3.6.2 Klik tab *Inlets* dan masukkan maklumat pada tab *SSL – Front* samaada *Mode Splitless* (Rajah 1) **atau** *Mode Split* (Rajah 2).





Rajah 2

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3.6.3 Klik tab *Columns* dan masukkan maklumat pada *Control Mode*



3.6.4 Klik tab *Detectors* dan masukkan maklumat pada *FID – Front*



3.6.5 Klik tab *Configuration*, kemudian klik tab *Modules* dan pilih *N2* pada *SS Inlet*. Kemudian klik *Apply* dan klik OK



3.6.6 Klik OK pada *Signal Details : Instrument 1* (Rajah 1) dan klik OK pada *Edit Integration Events* (Rajah 2).



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3.6.7 Klik OK pada Specify Report : Instrument 1 (Rajah 1) dan klik OK pada Run Time Checklist : Instrument 1 (Rajah 2).





G. Simpan Kaedah yang Telah Diwujudkan

3.7 Klik File dan pilih Save As, kemudian pilih Method...



3.7.1 Taip nama kaedah yang diperlukan dan diakhiri dengan .*M*, kemudian klik OK



H. Menjalankan Analisa 1 Sampel

3.8 Klik File dan pilih Load, kemudian pilih Method...



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3.8.1 Pilih kaedah yang diperlukan dan klik OK



3.8.2 Tunggu sehingga *Ready* sebelum menjalankan analisa sampel.



3.8.3 Klik *RunControl* dan pilih *Run Method* untuk memulakan analisa sampel.



I. Menjalankan Analisa Beberapa Sampel dalam Urutan

- 3.9 Klik *File* dan pilih *Load*, kemudian pilih *Method*..., seterusnya pilih kaedah yang diperlukan dan klik OK (sama seperti item 3.8 dan 3.8.1).
 - 3.9.1 Klik Sequence dan pilih Save Sequence Template As...



3.9.2 Taip nama urutan yang diperlukan dan diakhiri dengan .S, kemudian klik OK



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3.9.3 Klik Sequence dan pilih Sequence Paramaters



3.9.4 Pada tab Sequence Parameters, taip nama folder pada Subdirectory, kemudian klik OK



3.9.5 Klik Sequence dan pilih Sequence Table...



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3.9.6 Klik *Insert* untuk menambah baris yang diperlukan. Lengkapkan jadual di bahagian column Vial, Sample Name, Method Name, Inj/Vial, Sample Type dan Inj Volume. Dicadangkan column Vial bermula dengan 101 sehingga 116. Kemudian, klik *Run Sequence* untuk memulakan analisa sampel.



J. Semak Keputusan yang Telah Dianalisa

3.10 Pada desktop Windows, klik Instrument 1 Offline



3.10.1

Klik File dan pilih Load, kemudian pilih Method...

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ile Method Sequence Graphics Integrati	on	Calibration	Report
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3.10.2 Pilih kaedah yang diperlukan dan klik OK



3.10.3 Pilih *Folder* yang diperlukan pada *Data Analysis* dan klik + ditepi *Folder* tersebut. Pilih urutan data yang diperlukan.



3.10.4 Klik baris data yang diperlukan untuk melihat keputusan.

🔐 Instrumer	nt 1 (offline): De	sta Ans	lysis															
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K. Cetak Data

3.11 Klik Report dan pilih Print Specify Report...

🕌 Instrument 1 (offline): Data Analysis		
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3.11.1 Klik Signal Options...

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3.11.2 Pilih samaada perlukan data Full, Use Ranges atau Autoscale pada Ranges

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3.11.3 Jika pilih Use Ranges, masukkan maklumat yang diperlukan. Kemudian klik OK

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3.11.4 Klik OK pada Specify Report : Instrument 1



3.11.5 Klik Edit/Set Integration Events Table



3.11.6 Klik ikon *Printer* untuk mencetak data.

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22, PHTML Int 32, PHTML II Page 30, PHTML II Page 30, PHTML II Page 30, PHTML II PATHONE 30, PHTML P 40, PHTML Special Even 40, PHTML III PATHONE 40, PHTML III PATHONE 40, PHTML IIII PATHONE 40, PHTML IIII PATHONE 40, PHTML IIIII PATHONE 40, PHTML IIIII PATHONE 40, PHTML IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	sparation Events inger/Skin Hode Skin Height Rato Skin Height Rato Skin Videy Rato Skin Videy Rato inder Carection ask to Videy Rato for Signal Skin Laward Skin State Skin State Skin State Skin	Value Standard 0.00 0.00 20.00 Classical 500.00	eco 400 200 100 0 100 0	25	s Height	900 L-1	772.00 -10 Hereal	Symmetry	and the second s		· () () ()	Section 2		21 27 272 272
UHTMAL Int UHTMAL I	agration Events anger Skin Hode Sin Heger Ratio Sin Heger Ratio Sin Valey Ratio Sin Valey Ratio For Signal for Signal Integration Even	Value Standard 8.00 20.00 Classical 500.00		2 5 Time Are 0 972 4952	9 7 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	998 24 76 Width 01392	10 10 Area2	12 Symmetry 2 555-2	and the second s		建建了 74	a a a a a a a a a a a a a a a a a a a		21 27 270 272 270 270 270 270 270 270 270 270 270 270
Primit Int Primit Tar Pege Primit Tar Pege Primit Foot Pege Primit P P P	agration Events more Shin Hode Shin Heigh Rato Shin Heigh Rato Shin Heigh Rato Shin Yoley Rato Shin Yoley Rato Shin Yoley Rato Tor Signal 30 ▲ Integration Even Stop Ser	Value Standard 6.00 20.00 Objected 500.00 rits Value rits Value	eco 400 200 100 0 0 0 0 0	26 Time Are 0972 (\$200) 1.0077 (\$100)	9 9 14 Height 14 4249773 15 275001	900 000 7/8 Width 0.1332 0.2501	10 10 Area2 47382 50.000	52000000000000000000000000000000000000	A A A A A A A A A A A A A A A A A A A	Sector Contraction	and a second	2 (10)		21.022 and 0
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PRIVAL Int PRIVAL T PRIVAL T PRIVAL T PRIVAL Foot Pass PRIVAL P PRIVAL P <t< td=""><td>spraten Events more Shin Hode Shin Heigh Rate Shin Heigh Rate Shin Valey Rate Shin Valey Rate Shin Valey Rate Shin Valey Rate Shin Valey Rate Integration Even Shop Sen Peak Area 1 Height</td><td>Value Standard 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00</td><td>eco 400 200 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>25 Time Ann 0.972 4962 1.27 54111 2.299 2.3 2.299 2.3 2.209 2.3</td><td>9 8 14 14 14 14 14 14 14 15 15 15 15 15 15 15 15 15 15</td><td>98 5 5 7 8 7 8 With 0.1301 0.0014 0.0004 0.0053</td><td>10 10 10 10 10 10 10 10 10 10 10 10 10 1</td><td>2 855 10 57000010 2 8552 0 175 1 079 0 255 0 175 1 079 0 255 0 540 0 540</td><td>A Strategy of the strategy of</td><td>A TO A DAY</td><td>areas Aliante</td><td>and the second s</td><td></td><td>21.022 an one</td></t<>	spraten Events more Shin Hode Shin Heigh Rate Shin Heigh Rate Shin Valey Rate Shin Valey Rate Shin Valey Rate Shin Valey Rate Shin Valey Rate Integration Even Shop Sen Peak Area 1 Height	Value Standard 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	eco 400 200 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	25 Time Ann 0.972 4962 1.27 54111 2.299 2.3 2.299 2.3 2.209 2.3	9 8 14 14 14 14 14 14 14 15 15 15 15 15 15 15 15 15 15	98 5 5 7 8 7 8 With 0.1301 0.0014 0.0004 0.0053	10 10 10 10 10 10 10 10 10 10 10 10 10 1	2 855 10 57000010 2 8552 0 175 1 079 0 255 0 175 1 079 0 255 0 540 0 540	A Strategy of the strategy of	A TO A DAY	areas Aliante	and the second s		21.022 an one
PRIVAL	spratien Events more Shin Hode Niss San Heger Ratio San Heger Ratio San Valey Ratio Lastien Correction et a Valey Ratio Infor Signal Infor Signal Infor Signal Infor Signal Information Even Stop Ser Peak Ana 1 Height Shin	Value Standard 6.00 6.00 20.00 20.00 Directed 500.00	400 400 200 100 0 100 100 100 100 100 100 100	25 Time Anno 0.972 4982 20 20 20 20 20 20 20 20 20 2	8 1 Height 14 424572 5 225001 22 31 153	90 80 78 7.6 Width 0.1392 0.0051 0.0053 0.00553	47.982 10 10 1000 0.000 0.000	2 854 2 2 854 2 1 1079 0 275 0 643 0 55	a arter arte	A TOTAL	eren i	and a second sec		200720 COLOR
Reffield	Ingradian Events Ingrar Shin Mole Sina Haga Pato Sina Haga Pato Sina Yalay Rato San Yalay Rato S	Value Stander 0.00	600 400 300 100 0 100 0 100 0 100 0 100 0 100 0 0 100 0 0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	28 Tree Are 092 4882 127 54112 229 23 127 54112 229 23 127 54112 229 23 127 54112 129 23 120 21 120	9 1 1 1 1 1 1 1 1 1 1 1 1 1	900 L+ 7 8 With 0 1332 0 2811 0 0053 0 0053 0 00553 0 00553	Area% 47382 52.007 6.000 0.000 0.000 0.000	2 0125 2 0125 1 0175 1 0175 0 050 0 055 0 055	4 10 10 10 10 10 10 10 10 10 10 10 10 10			A CONTRACTOR OF		201212 201212 201212 201212
Image: Normal Line Image: Normal Line 1 al base 1 al base	In a serie series and a series of the series	Value Standard 0.01 0.00 0.00	600 600 100 100 100 100 100 100	25 Time Anno 972 4820 23 23 23 23 23 23 23 23 23 23 23 23 23	9 1 1 1 1 1 1 1 1 1 1 1 1 1	90 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	10 Area% 47382 52.007 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Symmetry 2.855 1075 1079 0.255 0.643 0.55 0.655 0.655	A Market	a and a second sec		and the second s		100000 1000000000000000000000000000000
00, унтянц	Internation Events Inger Shin Hook Shin Hingi Pato Shin Yiday Rato Shin Yiday Rato Shin Yiday Rato Shin Yiday Rato Internation Eve Post Shop See Post Shin	Value Standard 0.00 0.00 20.00 20.00 20.00 Descel 500.00 mb Value vide 0.00000 vide 0.00000 vide 0.00000 vide 0.00000 vide 0.00000 vide 0.000000 vide 0.000000	600 400 200 100 0 100 0 100 0 100 0 0 100 0 0 100 0 0 100 100 0 0 100 0 0 0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2.5 Time Ann 0.922 2.5 Time Ann 0.922 2.19	9 1 1 1 1 1 1 1 1 1 1 1 1 1	90 50 50 50 50 50 50 50 50 50 50 50 50 50	Area3 47.882 52.982 52.982 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Symmetry 2285-2 0175 0275 0645 055 1001 055 055 055 0558	A Strategy of the strategy of		ana	a and a a a a a a a a a a a a a a a a a		21222 22 22 22 22 22 22 22 22 22 22 22 2
400, 14 million 101 101, 14 million 101 101, 14 million 101 100, 14 million 100	spanien Evenit mager Shan Hode Shan Heige Fasto Shan Yang Fasto Shan Yang Fasto Shan Yang Fasto Shan Yang Fasto Shan Yang Fasto Fasto Shan Yang Shan Heiges Fasto Shan Yang Shan Heiges Fasto Shan Sha	Value Standard 0.07 0.07 20.00 0.07 20.00 Desceral 500.00 shingh 70.20079 volds 0.00527 shingh 70.20079 volds 0.00527 shingh 70.20079 volds 0.00527 shingh 70.20079 volds 0.00527 volds 0.00527 volds 0.00527 volds 0.00527 volds 0.00527 volds 0.00527	600 400 200 100 0 100 0 100 100 0 100 100 100	Time Are. 25 365 127 581 127 241 229 23 2660 111 3695 101 3695 101 3695 101 3695 101 3695 101 3695 101 3695 101 7665 11	9 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1	90 00 00 00 00 00 00 00 00 00 00 00 00 0	72 10 47382 52.007 0.000 0.000 0.000 0.000 0.000 0.000 0.000	2 854 2 854 2 854 2 854 2 854 2 855 1 075 1 075 1 007 0 653 0 558 0	A Contraction of the contraction		areast .	and a second sec		22225 22200

L. Tutup Sistem

- 3.12 Pada Instrument 1 Online, pilih Method Shutdown dan tunggu sehingga Ready
 - 3.12.1 Tutup Instrument 1 Online dan Instrument 1 Offline
 - 3.12.2 Tutup komputer dan suis *Gas Chromatography*.
 - 3.12.3 Tutup ketiga-tiga injap gas.

	JABATAN KIMIA	Kategori	Arahan Kerja
TINA	PROSEDUR PENGENDALIAN	Dokumen No.	AK/JK.P/A/01
UIVI	PERALATAN GC FID BAGI ANALISIS	Tarikh Semakan	<kosongkan></kosongkan>
	SAMPEL	Mukasurat:	13 daripada 13

4. PROSEDUR BERKAITAN

Instrument Usage/Service Application Procedure

GP-I-001

5. RUJUKAN SEMAKAN

SEMAKAN	DISEDIAKAN	DISEMAK	TARIKH	CATATAN
1	Pn. Ruhaida binti Bahru	Cik Norzalida binti Zakaria	01.08.2018	Isu kali pertama
	Pn. Nurul Hasmah binti Razman			
2	Pn. Ruhaida binti Bahru	Cik Norzalida binti Zakaria	17.08.2018	Isu kali kedua
	Pn. Nurul Hasmah binti Razman			