

เอกสารแบบ 31
เอกสารอนุญาตห้องปฏิบัติการ

Sartorius	REVIEW BY	[Redacted]
	APPROVED BY	[Redacted]
Certificate	NEXT CAL DATE	02/08/25
of Calibration	NEC-TIS-115 17025	
	CALIBRATION 0326	
		
Sartorius (Thailand) Co., Ltd. 135 Rama 9 Road, Huiyuanwang, Huayuanxing, Bangkok 10310 Tel : +66 2643 8351-6 , e-mail : service.thailand@sartorius.com		

Model Number :	MSE224S-100-DU	Certificate No. :	24BC0270
Description :	Analytical Balance	Issued Date :	Monday, August 05, 2024
Serial Number :	0027405555	Reference No. :	240942
ID No. :	BKK_EN0003		
Manufacturer :	Sartorius	Page No. :	1 of 2
Customer Name :	ALS Laboratory Group (Thailand)Co., Ltd. 104 Phatthanakan 40 Phatthanakan Rd., Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250.		
Calibrated Place :	Lab Room		

Calibrated Place: Lab Room

Calibrated By :	Mr.Chonchai Inthana	Calibration Procedure No. :	This calibration was conducted by
Calibration Date :	Fridsy, August 02, 2024	Using in-house calibration procedure number	WI-003
			Based on UMAS LAB 14 : 2019

Metrological data:		Ambients Conditions:	
Capacity:	220 g	Readability:	0.0001 g
		Temperature:	23.0 °C ± 5.0 °C
		Humidity:	55.0 % RH ± 10.0 % RH
		Pressure:	±
Reasons for calibration		Equipment Condition:	
☒ New Installation	☐ Service / Repaired	☒ Recalibration/ Maintenance	☒ Good Operate
☒ Fair			☐ Fair

Measurement Method UKAS Publication Ref :Lab 14

The measurement uncertainty stated is the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor ($k=2$) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM). The calibration certificate documents the traceability to National Standards, which realise the unit of measurement according to the International Standard System of Units (SI). Report of Tolerance came from list of Sartorius Metrological Specifications.

Traceability:

Model Number	Description	Traceability	Certificate No.	Due Date
YCS011-522-00	Sartorius weight set 1mg - 5000g E2,YCS011-522-00	TCS	M23081975	23-Aug-2025
Tcsto 174 H	Thermo-Hygrometer, Testo 174H	ENTECH	HJT 661303,H661140	12-Nov-2024

This certificate may not be reproduced other than in full except with the prior written approval of the Verification Operation Division Sartorius (Thailand) Co. Ltd.

SOP FM 33 03 February 2022

Equipment : Burette

Received Date : 23 February 2024

Condition As-Received : New Item

Calibration Date : 27 February 2024

Reference : 2402-0757DSC-1

Cert No.: 24CG952

Page: 2 of 2

Condition of this result of calibration

- ### 1. Reference Standard Instruments :

Instruments	Model	Serial No.	ID. No.	Certificate No.	Traceability	Due date
1) Balance	XP205DR	1126143764	140RC004	23MM538	TPA	15 Sep 2024
2) Thermo-Hygraph	THDX-CE	00016540	140EC001	23H1275	TPA	09 June 2024
3) Thermometer	-	0834181	140EC005	23I948	TPA	10 Aug 2024

2. The certificate is valid only to the item calibrated on date and place of calibration.
3. True value is converted to true volume at the standard temperature of 20 °C

Calibration result :

Nominal capacity (mL)	Reading (mL)	Uncertainty ($\pm$ mL)	<i>k</i> Factor
50	50.0032	0.010	2.00

Remark $\text{mL} = \text{cm}^3$

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k , providing a level of confidence of approximately 95 %.

-000-



Metrology

SCI ECO Services Company Limited

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Website : www.scieco.co.th E-Mail : calibrate@scg.com



NSC-TIS-TIS 17025
CALIBRATION 0244

Certificate No. T240904

Page 1 of 3

Certificate of Calibration

Equipment : Chamber (Oven)
Manufacturer : Memmert
Model : UF 450
Serial No. : B717.0531
Customer Code : BKK_EN0273
ID No. : T8042A4
Customer : ALS Laboratory Group (Thailand) Co.,Ltd.

104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan,
Khet Suan Luang, Bangkok 10250

Customer Location : Laboratory (Oven Room)

Date of Receipt : 08 May 2024

Calibrated By : Preecha Phisassuthikul (Temperature Calibration Manager)

Approved By : [Redacted] / Nuafun

Date of Issue : 23 MAY 2024

The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrology.

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Certificate of Calibration

SARTORIUS

Model Number : MSE224S-100-DU
Description : Analytical Balance
Serial Number : 0027405555
ID No. : BKK_EN0003
Manufacturer : Sartorius
Certificate No. : 24BC0270
Issued Date : Monday, August 05, 2024
Reference No. : 240942
Page No. : 2 of 2

Calibration Results : Without Adjustment

Repeatability		Eccentricity (Off-center loading error)	
The repeatability is the ability of a weighing instrument to display nearly identical readings under the same conditions. The repeatability is measured by weighing a series of identical test pieces on the weighing pan in the same manner. The standard deviation is used to express repeatability quantitatively.		The off-center loading error is yielded by the difference between the reading of the load in 1/2 or 1/4 of maximum capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to OIML R110).	
Nominal Value : (Low Load)	200.0000	Nominal value :	100 g
20 g	20.0000	Tolerance	0.0004 g
Tolerance	0.0001 g	Difference	
Nominal Value : (High Load)	200.0000	1	—
200 g	200.0000	2	0.0000
Tolerance	0.0001 g	3	0.0000
20.0000	20.0000	4	0.0000
20.0000	20.0000	5	0.0001
20.0000	20.0000	6	—
Standard Deviation	0.00004		

Linearity

The linearity, also called linearity error, describes the deviation of the characteristic curve of a weighing instrument from the linear slope.

Tolerance 0.0002 g		End of Report	
Nominal Value (g)	Conventional Mass Value (g)	Displayed Value (g)	Deviation (g)
0.01	0.0100	0.0100	0.0000
0.1	0.1000	0.1000	0.0000
1	1.0000	1.0000	0.00015
2	2.0000	2.0000	0.00015
5	5.0000	5.0000	0.00015
10	10.0000	10.0000	0.00015
20	20.0000	20.0000	0.00015
50	50.0000	50.0001	0.00016
100	100.0000	100.0001	0.00019
200	200.0000	200.0000	0.00029

End of Report



Metrology

SCI ECO Services Company Limited

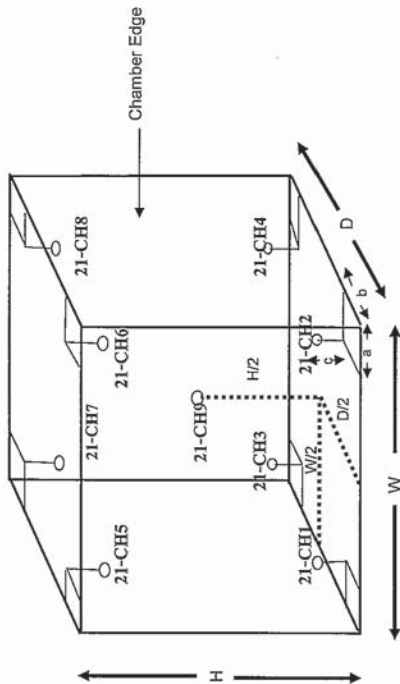
33/2 Moo 3, T. Banpa, A. Kaengkhoh, Saraburi 18110, Thailand.



Certificate No. T240904

Page 3 of 3

Calibration Report



Remark :

Internal Dimensions of Chamber : W (Width) = 104 cm. , H (Height) = 72 cm. and D (Depth) = 60 cm.
Size of Installed Standard sensor number 21-CH8 : a = 5 cm. , b = 5 cm. and c = 5 cm.
Size of Installed Standard sensor number 21-CH9 : W/2 = 104 cm./2 , H/2 = 72 cm./2 and D/2 = 60 cm./2

Measurement Results

Calibration Point	Average Standard Reading at each position (°C)								
	21-CH1	21-CH2	21-CH3	21-CH4	21-CH5	21-CH6	21-CH7	21-CH8	21-CH9
104	103.4	105.0	103.7	103.6	103.3	104.6	103.3	104.0	103.9
180	179.5	181.1	179.2	179.5	179.0	181.3	179.8	179.9	180.2

Chamber (Oven)		Temperature Distribution				
		Setting (°C)	Average (°C)	Stability (± °C)	Uniformity (°C)	Coverage Factor k
		Min , Max	Average			
104.0	103.9 , 104	104.0	103.85	0.14	1.27	2.00
180.0	179.9 , 180.1	180.0	179.94	0.39	2.29	2.00

* The quoted uncertainty exclude "uniformity"

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k which for a t-distribution, providing a level of confidence of approximately 95 % .

End of Certificate

Approved By _____



Metrology

SCI ECO Services Company Limited

33/2 Moo 3, T. Banpa, A. Kaengkhoh, Saraburi 18110, Thailand.



Certificate No. T240904

Page 2 of 3

Calibration Report

Equipment : Chamber (Oven)
Date of Calibration : 14 May 2024
Environment : Temperature : 26.5-28.1 °C
Line Voltage : 226.7-229.8 V
Relative Humidity : 51 - 57 %RH

Condition of this results of calibration :

1. This equipment was calibrated by insert nine resistance thermometer detectors into its chamber , the other one resistance thermometer detector use for ambient temperature measurement . The calibration was done in according to WI-T20 (based on ASTM E145-94 (Reapproved 2001) and AS2853-1986) .
All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .

2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
RTD	100 ohm	21-(CHI-10)	T231955	17 November 2024
DATA LOGGER	34970A	T121	T231955	17 November 2024

3. This certificate is traceable to :

National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244.)
4. Condition of calibrated item : good

Equipment Description :

Time Constant 1 Hour 30 Minute At 104 °C
Fresh Air Damper ☐ Open ☐ Min ☐ Medium ☐ Max
☐ Close
☒ Not Available

5. Adjustment :

(X) without adjustment () after adjustment

Approved By _____

Service Confirmation Number: 6905876103
Service Confirmation Date: 23.09.2024

Agilent Technologies

Agilent Technologies (Thailand) Limited
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Email: ccc-smt@agilent.com
Website: www.agilent.com/chem

Service Instrument:

Model Number	Model Description	Serial Number	System Handle	Parent Asset
SYS-ID-5100	ICP-OES 5100/5110 System			
G8010A	Agilent 5100 SVDV ICP-OES Spectrometer	MY16010005	ICP OES 5100	SYS-ID-5100
G8410A	SPS 4 Autosampler	AU15440764	ICP OES 5100	SYS-ID-5100

Service Items:

Item	Service/Part #	Description	Qty	Entitlement	Service Start	Service End
1000	EQQ	Enterprise Operational Qualification	1.00	Agreement Entitlement - 100 % covered	22.09.2024	23.09.2024
1010	6610030100	Bottle ICP-OES Wavecal soln 500mL 5 ppm	1.00	Agreement Entitlement - 100 % covered		
1020	5190-7001	Calibration blank solution 5ppt HNO3	1.00	Agreement Entitlement - 100 % covered		

Additional Information:

Customer Contact:

ALS Laboratory Group (Thailand) Co
Ltd Head Office
104 Phatthanakan 40 Phatthanakan Rd
Khwaeng Phatthanakan Khet Suan
TAX ID : 0105540004859
Chanatagarn.lnchom@alsglobal.com
27603088

Invoice To:

ALS Laboratory Group (Thailand) Co
Ltd Head Office
104 Phatthanakan 40 Phatthanakan Rd
Khwaeng Phatthanakan Khet Suan

SERVICE REPORT

Customer Purchase Order Number:	70371013
Service Request:	Service Request Date:
Service Order:	Service Confirmation:
8006676091	8905876103



Direct Inquiries to:

Contact Name: Customer Contact Center
Contact E-mail: ccc-smt@agilent.com
Contact Telephone: +662 637 6363
Contact Fax: +662 632 4334

Delivery Site:

ALS Laboratory Group (Thailand) Co
Ltd Head Office

Location:

Room
Bldg
Lab
Dept
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Khwaeng Phatthanakan Khet Suan

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Website : www.scieco.co.th E-Mail : calibrate@scg.co.th

Certificate No. T231676

Page 1 of 6

Certificate of Calibration

Equipment	: HEATING BLOCK
Manufacturer	: Environmental Express
Model	: SC 196
Serial No.	: 6974CECW3285
Customer Code	: BKK_EL0054
ID No.	: T5306A3
Customer	: ALS Laboratory Group (Thailand) Co.,Ltd. 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250
Customer Location	: Acid Digestion Lab
Date of Receipt	: 13 September 2023
Calibrated By	: Sanee Musikawan (Site Calibration Manager)
Approved By	:  / Sujjar Naknakred (Site Calibration Manager)
Date of Issue	: 26 SEP 2023

The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrological Center.

Service Information:			
Problem Description: WU-OQ-10-5100-5001253655			
Service Provided: Complete OQHW 5100ICPOES Equipment ID: BKK_EL0037, all test passed			
Service Overview Code: Reason Code: Scheduled Service Diagnosis Code: Scheduled Service Resolution Code: Scheduled Service			
Reported Hours: 4.0	Travel Hours: 2.0	Customer Field Service Representative Signature: 	Date: 23 Sep 2024
Customer Field Service Representative Name: Suwan Onkhom	Customer Signature: 		Date: 23 Sep 2024
Customer Name: CHANATTAGARN IMCHOM	Additional Comments:		



Certificate No. T231676

Page 3 of 6

Calibration Report

Equipment : HEATING BLOCK
Date of Calibration : 22 September 2023
Environment : Temperature : 21.8-23.1 °C
Line Voltage : 221.6-226.3 V
Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

1. This equipment was calibrated by insert 20 standard thermocouples type T into its chamber , the other one standard thermocouples type T use for ambient temperature measurement . The calibration was done in according to WI-T20.

All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .

2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
TC	TYPE T	TN21-TN30	T230014	17 January 2024
TC	TYPE T	TN31-TN40	T230014	17 January 2024
DATA LOGGER	34970A	T151	T230014	17 January 2024

3. This certificate is traceable to :

National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244.)

4. Condition of calibrated item : good

Equipment Description :

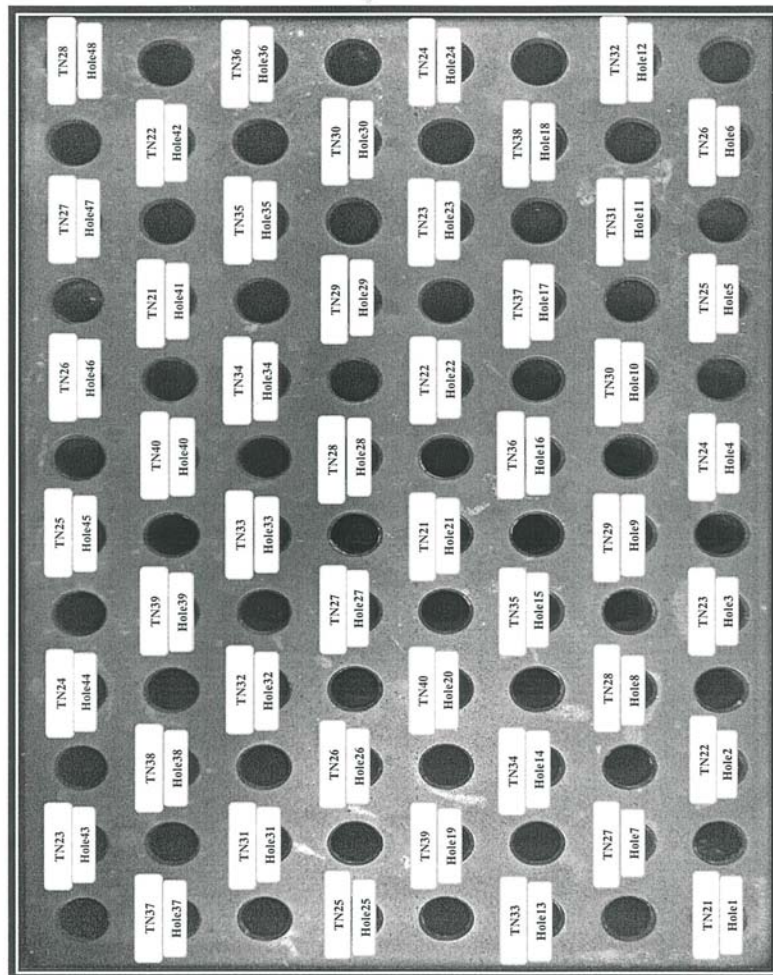
Time Constant 2 Hour 20 Minute At 95 °C
Fresh Air Damper ☐ Open ☐ Min ☐ Medium ☐ Max
☐ Close ☒ Not Available

5. Adjustment :
() without adjustment
(X) after adjustment

Approved By. _____

FRONT CONTROL

Approved By. _____



Calibration Report

Measurement Results		Average Standard Reading at each position (°C)										
Calibration Point		TN21	TN22	TN23	TN24	TN25	TN26					
R1 Hole1-Hole6	Max	TN23	TN22	TN23	TN24	TN25	TN26					
	Min	TN23	TN22	TN23	TN24	TN25	TN26					
	Average	TN23	TN22	TN23	TN24	TN25	TN26					
R2 Hole7-Hole12	Max	TN27	TN28	TN29	TN30	TN31	TN32					
	Min	TN27	TN28	TN29	TN30	TN31	TN32					
	Average	TN27	TN28	TN29	TN30	TN31	TN32					
R3 Hole13-Hole18	Max	TN33	TN34	TN35	TN36	TN37	TN38					
	Min	TN33	TN34	TN35	TN36	TN37	TN38					
	Average	TN33	TN34	TN35	TN36	TN37	TN38					
R4 Hole19-Hole24	Max	TN39	TN40	TN41	TN42	TN43	TN44					
	Min	TN39	TN40	TN41	TN42	TN43	TN44					
	Average	TN39	TN40	TN41	TN42	TN43	TN44					
R5 Hole25-Hole30	Max	TN45	TN46	TN47	TN48	TN49	TN50					
	Min	TN45	TN46	TN47	TN48	TN49	TN50					
	Average	TN45	TN46	TN47	TN48	TN49	TN50					
R6 Hole31-Hole36	Max	TN51	TN52	TN53	TN54	TN55	TN56					
	Min	TN51	TN52	TN53	TN54	TN55	TN56					
	Average	TN51	TN52	TN53	TN54	TN55	TN56					
R7 Hole37-Hole42	Max	TN57	TN58	TN59	TN60	TN61	TN62					
	Min	TN57	TN58	TN59	TN60	TN61	TN62					
	Average	TN57	TN58	TN59	TN60	TN61	TN62					
R8 Hole43-Hole48	Max	TN63	TN64	TN65	TN66	TN67	TN68					
	Min	TN63	TN64	TN65	TN66	TN67	TN68					
	Average	TN63	TN64	TN65	TN66	TN67	TN68					

Approved By.

Calibration Report

Measurement Results		Average Standard Reading at each position (°C)										
Calibration Point		TN21	TN22	TN23	TN24	TN25	TN26					
R1 Hole1-Hole6	Max	TN21	TN22	TN23	TN24	TN25	TN26					
	Min	TN21	TN22	TN23	TN24	TN25	TN26					
	Average	TN21	TN22	TN23	TN24	TN25	TN26					
R2 Hole7-Hole12	Max	TN27	TN28	TN29	TN30	TN31	TN32					
	Min	TN27	TN28	TN29	TN30	TN31	TN32					
	Average	TN27	TN28	TN29	TN30	TN31	TN32					
R3 Hole13-Hole18	Max	TN33	TN34	TN35	TN36	TN37	TN38					
	Min	TN33	TN34	TN35	TN36	TN37	TN38					
	Average	TN33	TN34	TN35	TN36	TN37	TN38					
R4 Hole19-Hole24	Max	TN39	TN40	TN41	TN42	TN43	TN44					
	Min	TN39	TN40	TN41	TN42	TN43	TN44					
	Average	TN39	TN40	TN41	TN42	TN43	TN44					
R5 Hole25-Hole30	Max	TN45	TN46	TN47	TN48	TN49	TN50					
	Min	TN45	TN46	TN47	TN48	TN49	TN50					
	Average	TN45	TN46	TN47	TN48	TN49	TN50					
R6 Hole31-Hole36	Max	TN51	TN52	TN53	TN54	TN55	TN56					
	Min	TN51	TN52	TN53	TN54	TN55	TN56					
	Average	TN51	TN52	TN53	TN54	TN55	TN56					
R7 Hole37-Hole42	Max	TN57	TN58	TN59	TN60	TN61	TN62					
	Min	TN57	TN58	TN59	TN60	TN61	TN62					
	Average	TN57	TN58	TN59	TN60	TN61	TN62					
R8 Hole43-Hole48	Max	TN63	TN64	TN65	TN66	TN67	TN68					
	Min	TN63	TN64	TN65	TN66	TN67	TN68					
	Average	TN63	TN64	TN65	TN66	TN67	TN68					

Approved By.



Metrology

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Certificate No. T232160

Page 1 of 4

Certificate of Calibration

Equipment : Chamber (Cooling Room)

Manufacturer : KOLDTECH

Model : KM 320

Serial No. : TBN-1012061/05

Customer Code : BKK_EN0167

ID No. : T2463A3

Customer : ALS Laboratory Group (Thailand) Co.,Ltd.

104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan,

Khet Suan Luang, Bangkok 10250

Customer Location : Laboratory

Date of Receipt : 29 November 2023

Calibrated By : Atiphong Rongrat (Technician)

Approved By : 

Date of Issue : 09 JAN 2024

The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrology.



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Website : www.scieco.co.th E-Mail : calibrate@scg.co.th

Certificate No. T231676

Page 6 of 6

Calibration Report

Measurement Results:

Setting (°C)	HEATING BLOCK			Temperature Distribution	
	Reading (°C)		Average	Stability (± °C)	Uncertainty (± °C)
	Min , Max				
100.0	100.3 , 100.5		100.4	0.26	0.81
107.0	107.0 , 107.1		107.1	0.19	0.78

* The quoted uncertainty exclude " uniformity "

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k which for a t-distribution, providing a level of confidence of approximately 95 % .

Approved By. _____



Metrology

SCI ECO Services Company Limited

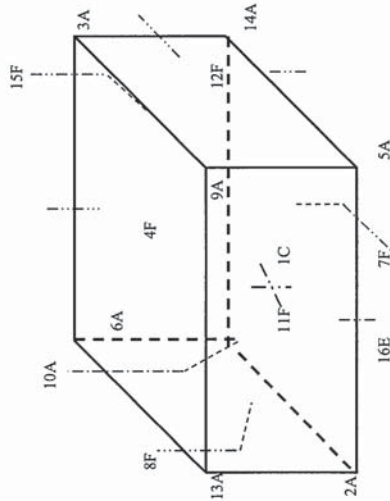
33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110, Thailand.



Certificate No. T232160

Page 3 of 4

Calibration Report



C = Centre, F = Centre of Face, A = Corner, E = Centre of Edge

1C	=	TNI161
2A	=	TNI162
3A	=	TNI163
4F	=	TNI164
5A	=	TNI165
6A	=	TNI166
7F	=	TNI167
8F	=	TNI168
9A	=	TNI169
10A	=	TNI170
11F	=	TNI171
12F	=	TNI172
13A	=	TNI173
14A	=	TNI174
15F	=	TNI175
16E	=	TNI176

Approved By. _____

FM-L15 118/18-08-66



Metrology

SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110, Thailand.



Certificate No. T232160

Page 2 of 4

Calibration Report

Equipment : Chamber (Cooling Room)
Date of Calibration : 6 December 2023
Environment : Temperature : 23.4-24.9 °C
Line Voltage : 221.4-230.2 V
Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

1. This equipment was calibrated by insert 16 standard thermocouples type T into its chamber , the other one standard thermocouples type T use for ambient temperature measurement . The calibration was done in according to WI-T20 (based on ASTM E145-94 (Reapproved 2001) and AS2853-1986).
All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .

2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
TC	TYPE T	TNI161-TNI170	T230773	10 April 2024
TC	TYPE T	TNI171-TNI180	T230773	10 April 2024
DATA LOGGER	34970A	T149	T230773	10 April 2024

3. This certificate is traceable to :

National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244.)

4. Condition of calibrated item : good

Equipment Description :

Time Constant 1 Hour 30 Minute At 3 °C
Fresh Air Damper ☐ Open ☐ Min ☐ Medium ☐ Max
☐ Close ☒ Not Available

5. Adjustment :

(X) without adjustment

() after adjustment

Approved By. _____

FM-L15 118/18-08-66



Agilent Technologies (Thailand) Limited
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Website: www.agilent.com/chem

Agilent Technologies

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Ltd
Head Office
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Khaeng Phatthanakan Khet Suan

TAX ID : 0105540004859

Chanattagarn.lmchom@alsglobal.com
27603068

Invoice To:

ALS Laboratory Group (Thailand) Co
Ltd
Head Office
104 Phatthanakan 40 Phatthanakan Rd
Khaeng Phatthanakan Khet Suan

SERVICE REPORT

Customer Purchase Order Number:	Customer Number: 70371013
Service Request:	Service Request Date:
Service Order: 6006041263	Service Confirmation: 6905338201



Direct Inquiries to:

Contact Name: Customer Contact Center
Contact E-mail: ccc-smt@agilent.com
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Location:

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Bldg
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Thailand



Metrology

SCI ECO Services Company Limited

33/2 Moo 3, T. Banpa, A. Kaengkhoei, Saraburi 18110, Thailand.



Certificate No. T32160

Calibration Report

Measurement Results

Calibration Point	Average Standard Reading at each position (°C)											
	TNI161	TNI162	TNI163	TNI164	TNI165	TNI166	TNI167	TNI168	TNI169	TNI170	TNI171	TNI172
3.0	2.83	3.34	2.95	3.46	3.45	3.76	3.25	3.46	3.39	3.58	3.42	
	TNI173	TNI174	TNI175	TNI176								
	3.33	3.39	3.15	3.43								

Chamber (Cooling Room)			Temperature Distribution				Coverage Factor <i>k</i>
Setting (°C)	Reading (°C)		Average (°C)	Stability (± °C)	Uniformity (°C)	Uncertainty (± °C)	
	Min ,	Max					
3.0	2.8 ,	4.1	3.5	1.10	2.00	1.90	2.09

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k which for a t-distribution, providing a level of confidence of approximately 95 % .

Approved By. [Signature]

Service Information:

Problem Description:
WU-OQ-IM/HPLC-7700-5001143313

Service Provided:
Perform OQ Hardware control test CSD logon, Autosample, ISIS, Auto tune, BG and Stability. After done the instrument BKK_EL0026 calibrated pass all.

Service Overview Code:
Reason Code: Scheduled Service
Diagnosis Code: Scheduled Service
Resolution Code: Scheduled Service

Reported Hours:
6.0

Travel Hours:
1.0

Customer Field Service Representative Name:
Panthep Kurasathain

Customer Name:
Supakwan Mak

Customer Field Service Representative Signature:

Customer Signature:

Date:
12 Dec 2023

Date:
12 Dec 2023

Additional Comments:

Service Instrument:

Model Number	Model Description	Serial Number	System Handle	Parent Asset
SYS-IM-7700-E	ICPMS 7700 System Enhanced		ICP MS 7700 (HPLC)	
G1316A	1260 Thermostatted Column Compartment	DEACN12300	ICP MS 7700 (HPLC)	SYS-IM-7700-E
G1329B	1260 Standard Autosampler	DEAAC11098	ICP MS 7700 (HPLC)	SYS-IM-7700-E
G1311B	1260 Quaternary Pump	DEAB704380	ICP MS 7700 (HPLC)	SYS-IM-7700-E
G3281A	Agilent 7700x ICP-MS	JP12091612	ICP MS 7700 (HPLC)	SYS-IM-7700-E

Service Items:

Item	Service/Part #	Description	Qty	Entitlement	Service Start	Service End
1000	EQQ	Enterprise Operational Qualification	1.00	Agreement Entitlement - 100 % covered	12.12.2023	12.12.2023
1010	5185-5850	ICP-MS Checkout Solutions	1.00	Agreement Entitlement - 100 % covered		

Additional Information:



บริษัท ดับเบิล เอส ไดแอกโนสติกส์ จำกัด
DOUBLE S DIAGNOSTICS CO., LTD.

4 ซอยสุขุมวิท 14 แขวงคลองเตย เขตคลองเตย 10260 โทรศัพท์ (02) 747-7009 โทรสาร (02) 747-7008
4 Soi Sukhumvit 14, Bangna, Bangkok 10260 Tel: (02) 747-7009 Fax: (02) 747-7008

Maintenance Plan YEAR : 2024

เดือน	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ทำ												

Periodical maintenance check list for Konelab

	6M	12M	Note
1.Diluent-wash tubing change	☐	☒	Yes
2.ISE tubing change	☒	☒	Yes
3.Syringe check/change	☒	☒	Yes
4.Dispensing check/ change	☒	☒	Yes
5.Waste tubing change when necessary	☒	☒	Yes
6.Lamp check/change	☒	☒	Yes
7.Mixer paddle/paddle change(not Konelab20)	☐	☒	Yes
8.ISE needles check/change	☐	☒	Yes
9.Pump tubing check/ chance	☐	☒	Yes
10.Broken/worn out part check /change	☐	☒	Yes
11.Peristaltic pump check /cleaning/ lubrication	☐	☒	Yes
12.Heating check	☐	☒	Yes
13.Cooling check	☐	☒	Yes
14.Dispenser mechanic check/adjustment	☐	☒	Yes
15.Cuvette transfer mechanic check/adjustment	☐	☒	Yes
16.Dispenser movement check/adjustment	☐	☒	Yes
17.Sample/reagent register check/adjustment	☐	☒	Yes
18.Dispensing tubing tightness check	☐	☒	Yes
19.Photometer and optics cleaning/check/adjustment	☐	☒	Yes
20.Workstation PC cleaning if necessary	☐	☒	Yes
21.Mechanic cleaning/lubrication	☐	☒	Yes
22.Instrument cleaning if necessary	☐	☒	Yes
23.Complete analyzer testing with waterblank/QC or sample	☐	☒	Yes
24.Test parameters/Adjustment/config. Save to USB key	☐	☒	Yes
25.UPS Test	☐	☒	Yes

Place: ALS LAB Instrument: K20 Aquakem
Date/Time: 16/8/22 Serial no: 82281
Service done by: P. P. P. Install date: 16/08/2024
Signature of customer: P. P. P. Date/Time: 16/08/2024

Performance Verification Certificate for Mercury Analyzer

PRODUCT ID

Quicktrace M-8000 , Teledyne Leeman Labs

Equipment ID

BKK_EL0128 Mercury Analyzer
S/N: US22133002

BKK_EL0129 Autosampler
S/N: 052222A560

Customer Name

ALS Laboratory Group (Thailand) Co., Ltd.

Address

104 Soi Pattana 40, Pattana Rd. Suan Luang, Suan Luang
Bangkok 10250 Thailand

Date of Qualified

December 6, 2024

Next Due date

December 6, 2025

This certifies for products which was performed in acceptable criteria specifications

Autosampler & Sample Introduction

PASSED

Analyzer

PASSED

Gas Liquid Separator & Dryer

PASSED

CVAFS Detector

PASSED

Electronics/Mechanical

PASSED

Data station/PC

PASSED

Analytical test

PASSED

Provided by

Scientist Instrument Co., Ltd.
113 Soi Ekachai 44, Ekachai Road
Khlong Bang Phran, Bangbon
Bangkok 10150 Thailand

Certified by

Service Engineer

Laboratory

Analyst User

MM-1608

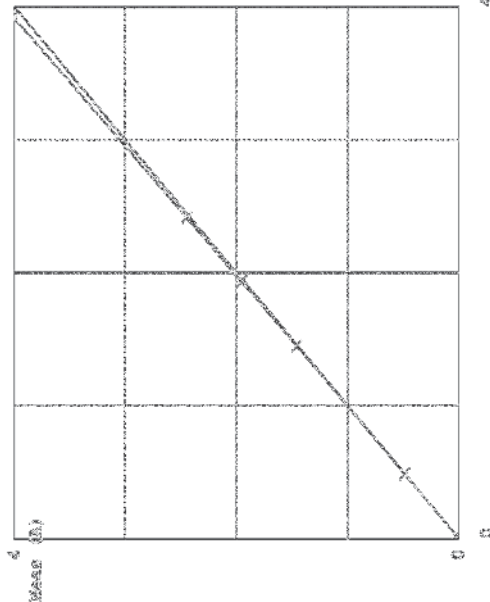
9/16/2024 14:53

Linearity of sample dispensing

Test	Absorbance (A)
XD12P2	0.306
XD12P4	0.812
XD12P10	1.471

Linearity of photometer

L340	Target (A)	Mean (A)	Delta (A)	Delta %
1	0.002	0.006	-0.004	-217.7
2	0.486	0.493	-0.007	-1.5
3	1.461	1.469	-0.013	-1.2
4	1.996	1.963	-0.027	-1.4
5	2.415	2.494	-0.079	-3.3



4 Target (A)

Laboratory

Analyst User

9/16/2024 14:53

Performed

9/16/2024

WD94

ACCEPTANCE CRITERIA

	Result	Limit	Warnings
Temperature (°C)	37.0	37.0 +/- 1.0	
Dispensing ratio CV%	16.4 0.23	14.8 ~ 17.2 <1.7	
Photometric noise Max SD L340_2 (mV) Max SD L340_4 (mV)	0.17 0.87	<2.0 <3.0	
Linearity of photometer Slope Curvature Max bias from linear fit (mV) Max delta %	1.0141 0.0053 4.3 -1.6	0.94 ~ 1.08 +/- 0.02 <15.0 +/- 6.0	
Linearity of sample dispensing Percent. volume XD12P2 (VL) Percent. volume XD12P4 (VL) XD12P2 CV% XD12P4 CV% XD12P10 CV%	2.08 4.14 1.21 0.90 0.68	1.96 ~ 2.16 3.85 ~ 4.40 <2.0 <2.0 <2.0	
Needle 0.21 volume Average (A) Standard deviation (A) Volume (VL)	0.005 0.002 0.03	<0.050 <0.005 <0.32	

OTHER INFORMATION

Dispensing ratio	Photom. noise: SD (mV)
Percent Result (%)	Percent L340_2 L340_4
1 0.1549	1 0.15 0.80
2 0.1549	2 0.17 0.79
3 0.1537	3 0.64 0.63
4 0.1547	4 0.16 0.81
5 0.1547	5 0.11 0.58
6 0.1545	6 0.14 0.87

Certificate No. T232158

Page 2 of 4

Calibration Report

Equipment : Chamber (Cooling Room)
Date of Calibration : 6 December 2023
Environment : Temperature : 23.4-24.9 °C
Line Voltage : 221.4-230.2 V
Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

1. This equipment was calibrated by insert 16 standard thermocouples type T into its chamber , the other one standard thermocouples type T use for ambient temperature measurement . The calibration was done in according to WI-T20 (based on ASTM E145-94 (Reapproved 2001) and AS2853-1986).
All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .

2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
TC	TYPE T	TN161-TN170	T230773	10 April 2024
TC	TYPE T	TN171-TN180	T230773	10 April 2024
DATA LOGGER	34970A	T149	T230773	10 April 2024

3. This certificate is traceable to :

National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244.)

4. Condition of calibrated item : good

Equipment Description :

Time Constant 2 Hour - Minute At 3 °C
Fresh Air Damper ☐ Open ☐ Min ☐ Medium ☐ Max
☐ Close
☒ Not Available

5. Adjustment :

(X) without adjustment () after adjustment

Approved By. _____



Metrology

SCI ECO Services Company Limited
33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110, Thailand.
Saraburi Tel : +66 3627 3096 Fax : +66 3627 3100
Bangkok Tel : +668 9205 6851, +669 8247 2360
Website : www.scieco.co.th E-Mail : calibrate@scg.com



Certificate No. T232158

Page 1 of 4

Certificate of Calibration

Equipment : Chamber (Cooling Room)

Manufacturer : KOLDTECH

Model : KM-240

Serial No. : TBN-1012061/06

Customer Code : BKK_EN0168

ID No. : T2462A3

Customer : ALS Laboratory Group (Thailand) Co.,Ltd.

104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan,

Khet Suan Luang, Bangkok 10250

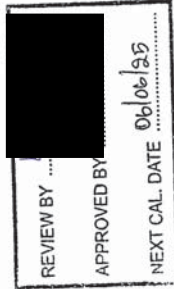
Customer Location : Laboratory

Date of Receipt : 29 November 2023

Calibrated By : Atiphong Rongrat (Technician)

Approved By : _____

Date of Issue : 09 JAN 2024



The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrology.



Metrology

SCI ECO Services Company Limited

33/2 Moo 3, T. Banpa, A. Kaengkhohi, Saraburi 18110, Thailand.



Certificate No. T232158

Page 4 of 4

Calibration Report

Measurement Results

Calibration Point	Average Standard Reading at each position (°C)											
	TN161	TN162	TN163	TN164	TN165	TN166	TN167	TN168	TN169	TN170	TN171	TN172
3.0	2.91	3.29	3.36	3.56	3.14	3.73	3.12	3.51	3.18	3.53	3.46	3.39
	TN173	TN174	TN175	TN176								
	3.29	3.38	3.30	3.23								

Chamber (Cooling Room)		Temperature Distribution			
		Setting (°C)	Average (°C)	Stability (± °C)	Uniformity (°C)
3.0	Min, Max	Coverage Factor & Factor k			
	2.5, 3.7	3.3	3.34	1.40	1.50

The calibration result apply only the above calibrated item.
The result of test was found accurate as shown on date and place of test only.
The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k which for a t-distribution, providing a level of confidence of approximately 95 %.

Approved By. _____

u.31/16

FM-L15 118/18-08-66



Metrology

SCI ECO Services Company Limited

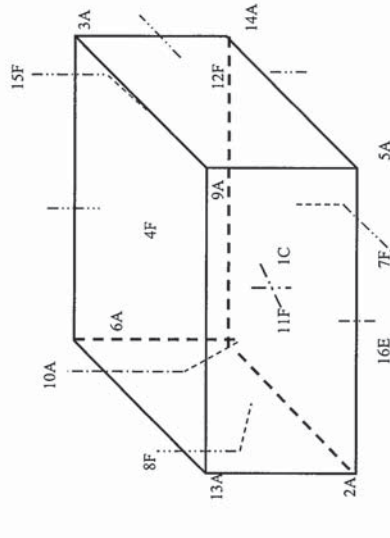
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Certificate No. T232158

Page 3 of 4

Calibration Report



C = Centre, F = Centre of Face, A = Corner, E = Centre of Edge

1C	=	TN161
2A	=	TN162
3A	=	TN163
4F	=	TN164
5A	=	TN165
6A	=	TN166
7F	=	TN167
8F	=	TN168
9A	=	TN169
10A	=	TN170
11F	=	TN171
12F	=	TN172
13A	=	TN173
14A	=	TN174
15F	=	TN175
16E	=	TN176

Approved By. _____

FM-L15 118/18-08-66



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MTOC : L-0614/2024

Report No. : ALS-799/01

Maintenance Sheet

Customer : ALS Laboratory Date : 26 / 06 / 2024
Model : ASI-L Serial No. H57415200799

Item	Carry out maintenance work	Result	Exchange	Comment
1.	Arm Drive section	O.K.		
	Check Arm Drive Belt for wear and tension	O.K.		
	Check grease of Screw Arm Drive	O.K.		
	Rinse pump (only ASI-V 24ml, 40ml)	O.K.		
2.	Check pump rate(>40mL/min)	O.K.		
	Check pump and tube connection for leakage	O.K.		
	Check if outlet flow is in proper condition	O.K.		
3.	Check and if necessary exchange consumable, Maintenance parts	O.K.		See appropriate list of maintenance parts
	Check Stirrer [When installed]	O.K.		
5.	Verify ASI function via mechanical check	O.K.		

Inspection by : [Redacted]

MTOC : L-0614/2024

Report No. : ALS-799/01

ASI Maintenance Report

Instrument : Automatic Sample Injector Measuring : Vial 40 mL
Model : ASI-L Place of Installation :-
Serial No. : H57415200799 Department : LABORATORY
Manufacture : Shimadzu

Customer : ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Khwaen Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand

Date of Maintenance : 26 / 06 / 2024

Ambient Condition : Temperature 25.5 ± 5 °C
Humidifier 58 ± 15 %RH

REVIEW BY [Redacted]

APPROVED BY [Redacted]

NEXT CAL. DATE 26 / 6 / 27

Maintenance By : [Redacted]
(Mr. [Redacted]) technician

Approved By : [Redacted]
technician Manager

User Name : [Redacted]
(Mr. [Redacted])



Automation Service Co.,Ltd.

Head Office : 929/29/1 Soi Pattanakarn 30,
Pattanakarn Road, Suanluang, Bangkok
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Prachinburi : 688 M.10, Thatum, Srimahaphote, Prachinburi [T. 037-208-880]



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Prachinburi : 688 M.10, Thatum, Srimahaphote, Prachinburi [T. 037-208-880]

MTOC : L-0613/2024

Report No. : ALS-416/01

TOC-L Maintenance Report

Instrument : Total Organic Carbon Analyzer Measuring : TC 0 ~ 30000 mg/L
Model : TOC-LCSH Place of Installation : -
Serial No. : H54425300416 Department : LABORATORY
Manufacture : Shimadzu
Customer : ALS Laboratory Group (Thailand) Co.,Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Khwaen Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand

Date of Maintenance : 26 / 06 / 2024

Ambient Condition : Temperature 25.5 ± 5 °C
: Humidifier 58 ± 15 %RH

Maintenance By : (Mr. [Redacted]) Technician

Approved By : ([Redacted]) Technician Manager

User Name : ([Redacted])

SHIMADZU ANALYZER
1/4

MTOC : L-0614/2024

Report No. : ALS-799/01

List of Consumable, Maintenance parts

Pos.	Part Number	Part Name	Result	Exchange	Recommended Interval
1.	017-27021-01	Grease Paste, Lubricant 100g	O.K.	✓	1 time per year
2.	032-22661-02	Belt, 60S2m596, Arm Drive	O.K.		1 time per year
3.	034-03067-02	Spring, F-642, Arm Drive	O.K.		Depending on condition
4.	042-00405-11	Pump Head, for ASI Rinse Pump	O.K.		Depending on condition
5.	638-41448-01	(only ASI-V 24mL, 40mL) Std. Needle Type1 24mL, 40mL *	N/A		After 300 h of operating
6.	638-41448-02	(for tube 2, 1x1, 6), (Sparge needle) Std. Needle Type1 125mL * (for tube 2, 1x1, 6)	N/A		Depending on condition
7.	631-41660-03	Flare Pipe 2x1.5x700mm * (for Standard Needle Type1 24mL, 40mL, 125mL)	N/A		Depending on condition (may cut to origin length 600mm)
8.	638-41450-01	Particles, * Needle for Suspended 0.8mm (only ASI-V 24mL, 40mL)	N/A		Depending on condition
9.	638-41450-01	Std. Needle Type2 125mL * (for tube 1.4x0.9)	N/A		Depending on condition
10.	638-41472-01	Std. Needle Type2 24mL, 40mL * (for tube 1.4x0.9)	O.K.		Depending on condition
11.	631-41660-02	Flare Pipe 1.4x0.9x600mm * (for Suspended + Needle Type2)	O.K.		Depending on condition
12.	638-41449-01	Double Needle, only 24mL, 40mL (simultaneous sparge type) *	N/A		Depending on condition
13.	631-41660-01	Flare Pipe 1.1x0.6x600mm * (for Double Needle 24mL, 40mL)	N/A		Depending on condition

*Note: needed parts depending on installed needle types!

Inspection by : ([Redacted]) Technician

SHIMADZU ANALYZER
3/3

Sales & Service Center
Rayong : 1/15 Huaypong Rd., Muang, Rayong [T. 038-692-152]
Lamphun : 122/5 M.4, Ban Klang, Muang, Lamphun [T. 053-581-876]
Prachinburi : 688 M.10, Thatum, Sirinaphaphote, Prachinburi [T. 037-208-880]

Report No.: ALS-416/01

Item	Carry out maintenance work	Result	Exchange	Comment
8.	Due to instrument condition, clean the instrument inside and outside.	O.K.		
9.	After checking the system and exchanging of consumable and maintenance parts a new 1-3 point calibration have to be done.	O.K.		Addition test 1.
10.	After wards the calibration perform check sample measurement.	O.K.		Addition test 2.

Addition test

Test no.	Test conditions	Meas. value	Result
1.	Calibration TC standard solution at 0, 0.1, 0.5, 1, 5 10, 20 injection volume 50 µL No. of measurement 2 times (Max.3)	0.9996	Attachment : ALS-416/01 Page 1/4 -2/4
	Criteria : R ² = 0.995 or more		Pass
2.	Measurement of reagent water and TC standard solution at 5.0 mg/L injection volume 50 µL No. of measurement 2 times (Max.3) and calculate accuracy by <u>Meas. of TC standard – Meas. of Reagent water</u>	5.216 – 0.2800 = 4.936 ppm	Attachment : ALS-416/01 Page 3/4 – 4/4
	Criteria : Accuracy %Recovery 10% or less		Pass

Inspection by : _____ (M) _____ technician

SHIMADZU ANALYZER
3/4

3/4

Maintenance Sheet

Report No.: ALS-416/01

Customer : ALS Laboratory Date : 26 / 06 / 2024
 Model : TOC-LCSH Serial No. H54425300416

Item	Carry out maintenance work	Result	Exchange	Comment
1.	Check functionality of the device Check furnace temperature (Standard cat. 680 °C / for TN cat. 720 °C) Check dehumidifier temperature (1 °C) Check the entire flow line related to leakage Check baseline status (OK) Check carrier gas pressure (200 ±10 kPa) Check carrier gas flow rate (150 mL/min)	O.K. O.K. O.K. O.K. O.K. O.K.		
2.	Tubes Check all tubing for contamination, if necessary clean them Check all tubing for tight connection Container and Drainage Fill up humidifier with pure water to max. level Check filling of dilution water and acid container Rinse Drain Pot, after wards refill again with pure water	O.K. O.K. O.K. O.K. O.K. O.K.		
3.	Check all tubing for tight connection Container and Drainage Fill up humidifier with pure water to max. level Check filling of dilution water and acid container Rinse Drain Pot, after wards refill again with pure water	O.K. O.K. O.K. O.K. O.K.		
4.	TC and IC Injection Clean injector Block Check injector Block for wear Check injection tube adjustment Check injection for leakage Check injection for clogging IC Measurement (N-type) Check acidification in syringe Check sparging in syringe	O.K. O.K. O.K. O.K. O.K. O.K. O.K.		
5.	Check acidification in syringe Check sparging in syringe	O.K. O.K.		
6.	Eye check of 8-Port valve, for sample residues or moist spots that indicate possible leakage	O.K.		
7.	Check and if necessary exchange consumable, Maintenance parts	O.K.		See list of consumable, maintenance parts

Inspection by : _____ Technician

SHIMADZU ANALYZER
2/4

2/4

TOC-Control L Report

2024_06_26_001_PN.tsk

Instrument Information

Instrument Options
Catalyst

TOC/ASI/IC Unit/
Regular Sensitivity

Cal. Curve

Sample Name:
Sample ID:
Cal. Curve:
Status:

Unitless
TC L1 - 20 pm 2024_06_26_13_54_50 cal
Completed

Type	Actual
Standard	IC

Conc: 0.000mg/L

No.	Area	Inj Vol	Aut. Dil	Rem.	Ex.	Date / Time
1	0.7202	50uL	1.000	*****		6/26/2024 1:39:37 PM
2	0.5997	50uL	1.000	*****		6/26/2024 2:01:47 PM

Acid Add: 0.009%
Mean Area: 0.6600
SD Area: 0.08521
CV Area: 12.91%



Conc: 0.1000mg/L

No.	Area	Inj Vol	Aut. Dil	Rem.	Ex.	Date / Time
1	1.249	50uL	10.00	*****		6/26/2024 2:08:39 PM
2	1.139	50uL	10.00	*****		6/26/2024 2:11:28 PM

Acid Add: 0.009%
Mean Area: 1.194
SD Area: 0.07778
CV Area: 6.51%



Conc: 0.5000mg/L

No.	Area	Inj Vol	Aut. Dil	Rem.	Ex.	Date / Time
1	1.899	50uL	2.000	*****		6/26/2024 2:17:43 PM
2	1.779	50uL	2.000	*****		6/26/2024 2:19:52 PM

Acid Add: 0.006%
Mean Area: 0.00485
SD Area: 0.00485
CV Area: 4.61%



Conc: 1.0000mg/L

MTOC : L-0613/2024

Report No. : ALS-416/01

List of Consumable, Maintenance parts

Pos.	Part Number	Part Name	Result	Exchange	Recommended Interval
1.	036-11209-84	O-ring, 4D P10A (Viton , for TC,IC Slider)	O.K.	✓	1 time per year, Depending on condition
2.	036-11219-84	O-ring, 4D P20 (for sealing TC-Combustion tube)	O.K.	✓	1 time per year, Depending on condition
3.	638-15025	O-ring, PIPE (for TC,IC-Slider)	O.K.	✓	1 time per year, Depending on condition
4.	630-00105-01	Platinum net, (2pcs-set) (to support catalyst)	O.K.	✓	6 month same time as catalyst exchange
5.	630-00557	Silica Wool (to support catalyst)	O.K.	✓	6 month same time as catalyst exchange
6.	630-00992	Halogen Scrubber	O.K.	✓	6 month
7.	630-00996	High Sensitivity TC Catalyst (When installed)	N/A		Depending on condition
8.	638-60116	Regular Catalyst (33g) (When installed)	O.K.	✓	6 month
9.	638-56251-01	8-Port valve rotor	O.K.		1 time per year
10.	638-41323	TC-Combustion Tube	O.K.	✓	6 month same time as catalyst exchange
11.	631-43404-01	Packing, gasket slider (for TC-Injection tube)	O.K.		1 time per year, Depending on condition
12.	638-59296	Syringe 5mL	O.K.		Depending on condition
13.	638-59296-01	Plunger Tip (for syringe 5mL)	O.K.		6 month
14.	042-00405-11	IC reagent supply pump head	O.K.		1 time per year
15.	630-00999	CO2-Absorber (for cell space purge)	O.K.		1 time per year
16.	630-00964	Molecular Sieves 13x	O.K.	✓	1 time per year

Note. Table indicates the guidelines replacement periods when NPOC measurement is performed on sample that are comparatively as clean as tap water ,use standard catalyst and at a rate of about 500 sample per month (operating five days a week)

Inspector By

(M) Technician

SHIMADZU ANALYZER
4/4

TOC-Control L Report

ALS
2024_06_26_001_PM.tlx

Inst: Information
Instrument Options
Catalyst:

TOC/AS/UC Unit/
Regular Sensitivity

Sample

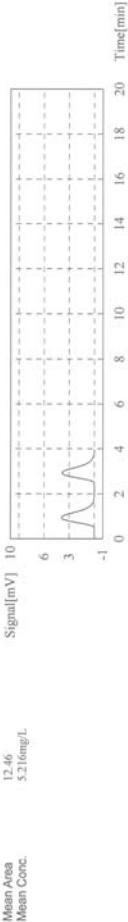
Sample Name: Std. TC
Sample ID: 5 ppm
Origin: TC 0.1 - 20 ppm.cal
Status: Completed
Chk. Result:

Type	Area	Manual Division	Result
Unknown	TC	1.000	TC 5.216mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Acid Dil.	Rem.	Exc.	Cal. Curve	Date / Time
1	12.50	5.235mg/L	50uL	1.000			TC 0.1 - 20 ppm.2024_06_26_13_54_50.cal	6/26/2024 3:01:20 PM
2	12.41	5.197mg/L	50uL	1.000			TC 0.1 - 20 ppm.2024_06_26_13_54_50.cal	6/26/2024 3:03:42 PM



TOC-Control L Report

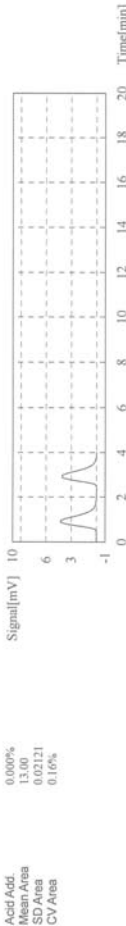
ALS
2024_06_26_001_PM.tlx

No.	Area	Inj. Vol.	Acid Dil.	Rem.	Exc.	Date / Time
1	3.121	50uL	1.000	*****	U	6/26/2024 2:25:48 PM
2	2.930	50uL	1.000	*****		6/26/2024 2:25:08 PM
3	2.899	50uL	1.000	*****		6/26/2024 2:27:18 PM



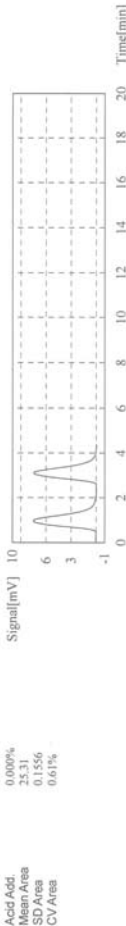
Conc: 5.000mg/L

No.	Area	Inj. Vol.	Acid Dil.	Rem.	Exc.	Date / Time
1	12.98	50uL	4.000	*****		6/26/2024 2:44:18 PM
2	13.01	50uL	4.000	*****		6/26/2024 2:37:06 PM



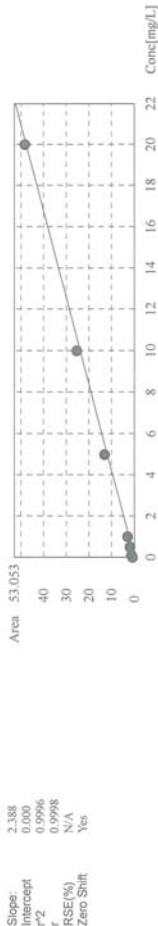
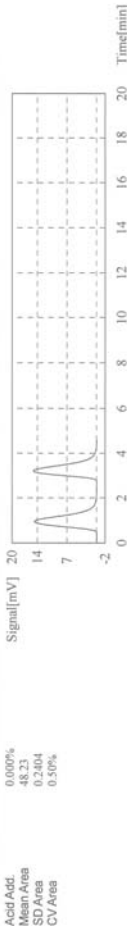
Conc: 10.000mg/L

No.	Area	Inj. Vol.	Acid Dil.	Rem.	Exc.	Date / Time
1	23.20	50uL	2.000	*****		6/26/2024 2:43:28 PM
2	23.42	50uL	2.000	*****		6/26/2024 2:45:58 PM



Conc: 20.000mg/L

No.	Area	Inj. Vol.	Acid Dil.	Rem.	Exc.	Date / Time
1	48.40	50uL	1.000	*****		6/26/2024 3:40:27 PM
2	48.06	50uL	1.000	*****		6/26/2024 3:52:01 PM





TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3 : EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000 FAX. 0-2719-9484

Cert.No.: 23TW243
Page.: 1 of 2

Certificate of Testing

Equipment :	DO Meter
Manufacturer :	YSI
Model :	5000-230V
Serial No. :	08J101147
ID No. :	BKK_EN0017
Received Date :	15 November 2023
Test Date :	16 November 2023
Reference :	2311-0505DSC-4
Submitted by :	ALS Laboratory Group (Thailand) Co.,Ltd. 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand
Laboratory Condition :	Temperature (25 ± 5) °C Humidity (50 ± 20) % In - house method : CP-CH9
Test Procedure :	by Comparison Technique with Azide Modification Method
Tested by :	Walalak Sirithean
Approved by :	 Approved Signatory

(✓) Sathip Meangmai
() Warakorn Lerngagrakul
() Ponpan Paipim

Issue Date : 17 November 2023

Instrument Information
Instrument Options
Catalyst

TOC/AS/IC Unit/
Regular Sensitivity

Sample

Sample Name: water
Sample ID: Untitled
Origin: TC 0.1 - 20 ppm cal
Status: Completed
Chk. Result

Type	Area	Manual Calibration	Result
Unknown	TC	1.000	TC 0.260mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Eq. Val.	Area	Ex.	Cal. Curve	Date / Time
1	0.6729	0.2818mg/L	50uL	1.000		TC 0.1 - 20 ppm 2024_06_26_13_54_50 cal	6/26/2024 1:08:11 PM
2	0.6642	0.2782mg/L	50uL	1.000		TC 0.1 - 20 ppm 2024_06_26_13_54_50 cal	6/26/2024 3:10:21 PM

Mean Area
Mean Conc.

0.6685
0.2800mg/L





TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
53/44 PAITANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-29 FAX. 0-2719-9484



Cert. No.: 23LM192
Page.: 1 of 2

Certificate of Calibration

Equipment : DO Meter with Sensor
Manufacturer : YSI
Model : 5000-230V
Serial No. : 08J101147
ID No. : BKK_END017
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Khwaeng Phatthanakan, Khet Suan Luang,
Bangkok 10250 Thailand
Location : TPA Chemistry Calibration Laboratory
Received Order : 15 November 2023
Calibrated Date : 16 November 2023
Ambient Temperature : (28 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V

Calibrated by : Kunchit Promprat

Approved by : 
Approved Signatory

() Pornthippa Tameyakul
() Ponpan Paipim
(✓) Suwit Injai

Issue Date : 17 November 2023

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written
Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.

A 0060730



Cert.No.: 23TW243
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :

This certification is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments	Serial No.	ID No.	Certificate No.	Due Date
1) Burette	-	130BU10	23CG1172	22 Mar 2025
2) Balance	1124013382	140RC006	23MM18	20 Feb 2024

2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate pentahydrate	Merck	AM1763316	100.2%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 16K100498

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.18	8.18	0.0055

This report was certified only for the instrument we tested. It is allowable to use for study the system efficiency. The environmental impact control and present to organization it may concerned intend to use for advertising and referral purpose is prohibited. This report may not be reproduced other in full, without written approval of the laboratory

-000-

Saitip

a 1190297



CERTIFICATE No : 24T2852
REFERENCE No : 72619-8

PAGE : 1 OF 2

Certificate of Calibration

EQUIPMENT : COOLED INCUBATOR
MANUFACTURER : MEMMERT
MODEL : ICP750
SERIAL No : F819.0021
ID No : BKK_EN0304
CONDITION AS RECEIVED : USED ITEM
SUBMITTED BY : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN
RD., KHWAENG PHATTHANAKAN, KHET SUAN
LUANG, BANGKOK 10250, THAILAND

REVIEW BY : [Redacted]
APPROVED BY : [Redacted]
NEXT CAL. DATE : 30/03/25

CALIBRATED BY : CHAICHARN CH.
CALIBRATION DATE : 20-Mar-24

APPROVED BY : [Redacted]
ISSUED DATE : 21-Mar-24
RECEIVED DATE : 20-Mar-24



Equipment : DO Meter with Sensor
Condition As-Received : Used Item
Reference : 2311-0505DSC-10
Procedure Used :-

Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with Industrial Platinum Resistance Thermometer (IPT) into Temperature Bath.
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument : Digital Thermometer
Serial No. : 3240076
Cert. No. : 231305
Traceable : TPA
Due Date : 15 Mar 2024

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function : Temperature measurement.

This instrument was connected with temperature sensor, S/N.: 16K100498

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
20.0	60	19.997	19.93	-0.067	0.15	2.00

UUC* : Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k , providing a level of confidence of approximately 95 %.

-000-



Metrological Center

SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110

Telephone : +66 2 586 5792-4 Fax : +66 2 586 5109

Website : www.scieco.co.th E-Mail : calibrate@scg.co.th

Certificate No. T240741

Page 1 of 5

Certificate of Calibration

Equipment : HOT BLOCK
Manufacturer : Environmental Express
Model : B3000- 240
Serial No. : 2017CODW116
Customer Code : BKK_EN0222
ID No. : T6769A4

REVIEW BY	APPROVED BY
NEXT CAL. DATE	22/04/25

Customer : ALS Laboratory Group (Thailand) Co.,Ltd.
104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan,
Khet Suan Luang, Bangkok 10250

Customer Location : Wet Chemistry Lab2

Date of Receipt : 11 April 2024

Calibrated By : Sancee Musikawan (Site Calibration Manager)

Approved By : [Redacted]

Date of Issue : 23 APR 2024

The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrological Center.

FM-L12 109/30-05-57



QUALITY CALIBRATION CO.,LTD.

235 Petchkasem 63/2 Road, Laksong, Bangkok 10160
Tel (662) 421-5402, (662) 444-0152-3, Fax (662) 809-4584

CERTIFICATE No : 24T2852

PAGE : 2 OF 2

Calibration Report

EQUIPMENT : COOLED INCUBATOR
MANUFACTURER : MEMMERT
MODEL : ICP750
ID No : BKK_EN0304
RECEIVED DATE : 20-Mar-24
AMBIENT TEMPERATURE : 26 °C ± 1 °C
S/N : F819.0021
CALIBRATION DATE : 20-Mar-24
RELATIVE HUMIDITY : 54 %RH ± 10 %RH

CONDITION OF THIS RESULTS OF CALIBRATION

1. THIS INSTRUMENT WAS CALIBRATED ACCORDING TO TLAS G-20 BY COMPARISON WITH CALIBRATED THERMOCOUPLE TYPE K UNDER NO LOAD CONDITION. THE THERMOCOUPLES WERE PLACED ON NINE POINTS AND LOCATED ONE THERMOCOUPLE IN EACH OF THE EIGHT CORNERS OF THE CHAMBER AND WAS AWAY FROM THE EACH WALL OF 5 cm TO 10 cm. AND PLACED THE NINTH THERMOCOUPLE WITHIN 2.5 cm. OF THE GEOMETRIC CENTER OF THE CHAMBER. THE UNIFORMITY WAS MEASURED BETWEEN REFERENCE PROBE AND OTHER PROBES AT THE SAME TIME.

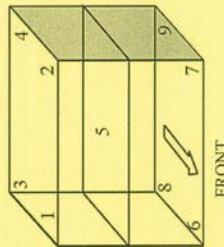
2. REFERENCE STANDARD INSTRUMENTS :-

1) DATA LOGGER WITH TC TYPE K HYDRA 2635A
3. THE CERTIFICATE IS VALID FOR THE ITEM CALIBRATED AS SHOWN ON THE DATE AND PLACE OF CALIBRATION ONLY.
4. THIS RESULT EXCLUDE LONG TERM STABILITY OF THE UNIT UNDER CALIBRATION.
5. THIS CERTIFICATE IS TRACEABLE TO THE INTERNATIONAL SYSTEM OF UNIT MAINTAINED AT:-
- NATIONAL INSTITUTE OF METROLOGY (THAILAND) THROUGH QUALITY CALIBRATION CO.,LTD.

RESULT OF CALIBRATION :- WITHOUT ADJUSTMENT

GENERAL INFORMATION

Overall Ambient Temperature around the Chamber (°C) variation : ±1
Overall Line Voltage (V) variation : ±5
Instrument Condition : Normal



CHAMBER PERFORMANCE

Controller Temperature (°C)	Indicating Temperature (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
20.0	20.0	0.16	0.21	0.41

TEMPERATURE MEASUREMENT ACCURACY TEST

Controller Temp (°C)	Indicating Temp (°C)	Measured Temperature (°C) at Spread Locations									Uncertainty (±°C)
		#1	#2	#3	#4	#5	#6	#7	#8	#9	
20.0	20.0	19.88	19.93	19.87	19.86	19.98	19.94	19.94	19.89	19.91	0.42

NOTE 1 : THE UNCERTAINTY OF MEASUREMENT EXCLUDED TEMPERATURE UNIFORMITY OF THE CHAMBER.

NOTE 2 : LOCATION 5 WAS REFERENCE LOCATION.

NOTE 3 : THIS CALIBRATION WAS CARRIED OUT AT THE CUSTOMER'S PLACE AT LABORATORY AREA.

THE REPORTED UNCERTAINTY OF MEASUREMENT WAS BASED ON A STANDARD UNCERTAINTY MULTIPLIED BY A COVERAGE FACTOR k =2, PROVIDING A LEVEL OF CONFIDENCE APPROXIMATELY 95%.
END OF CALIBRATION REPORT



Metrological Center

SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110
Telephone : +66 2 586 5792-4 Fax : +66 2 586 5109
Website : www.scieco.co.th E-Mail : calibrate@scg.co.th



Metrological Center

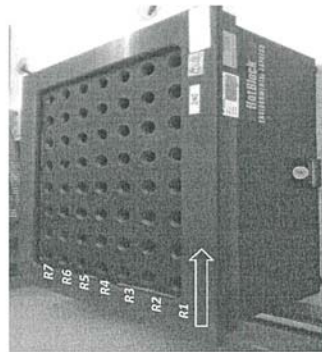
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Certificate No. T240741

Page 3 of 5

Calibration Report



Row	H49	H50	H51	H52	H53	H54	H55	H56
R7	H49	H50	H51	H52	H53	H54	H55	H56
R6	H41	H42	H43	H44	H45	H46	H47	H48
R5	H33	H34	H35	H36	H37	H38	H39	H40
R4	H25	H26	H27	H28	H29	H30	H31	H32
R3	H17	H18	H19	H20	H21	H22	H23	H24
R2	H9	H10	H11	H12	H13	H14	H15	H16
R1	H1	H2	H3	H4	H5	H6	H7	H8

H: STANDARD THERMOCOUPLE TYPE T

H1	TN21	H9	TN29	H17	TN37	H25	TN25	H33	TN33	H41	TN21	H49	TN29
H2	TN22	H10	TN30	H18	TN38	H26	TN26	H34	TN34	H42	TN22	H50	TN30
H3	TN23	H11	TN31	H19	TN39	H27	TN27	H35	TN35	H43	TN23	H51	TN31
H4	TN24	H12	TN32	H20	TN40	H28	TN28	H36	TN36	H44	TN24	H52	TN32
H5	TN25	H13	TN33	H21	TN21	H29	TN29	H37	TN37	H45	TN25	H53	TN33
H6	TN26	H14	TN34	H22	TN22	H30	TN30	H38	TN38	H46	TN26	H54	TN34
H7	TN27	H15	TN35	H23	TN23	H31	TN31	H39	TN39	H47	TN27	H55	TN35
H8	TN28	H16	TN36	H24	TN24	H32	TN32	H40	TN40	H48	TN28	H56	TN36

Approved By. _____

Certificate No. T240741

Page 2 of 5

Calibration Report

Equipment : HOT BLOCK
Date of Calibration : 22 April 2024
Environment : Temperature : 22.9-24.4 °C
Line Voltage : 222.7-227.8 V
Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

1. This equipment was calibrated by insert 20 standard thermocouples type T into its chamber , the other one standard thermocouples type T use for ambient temperature measurement . The calibration was done in according to WI-T20 (based on ASTM E145-94 (Reapproved 2001) and AS2853-1986).

All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .

2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
TC	TYPE T	TN21-TN30	T240235	17 February 2025
TC	TYPE T	TN31-TN40	T240235	17 February 2025
DATA LOGGER	34970A	T195	T240235	17 February 2025

3. This certificate is traceable to :

National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244.)

4. Condition of calibrated item : good

Equipment Description :
Time Constant 1 Hour 10 Minute At 150 °C
Fresh Air Damper ☐ Open ☐ Min ☐ Medium ☐ Max

☒ Not Available

5. Adjustment :

(X) without adjustment () after adjustment

Approved By. _____



Calibration Report

Measurement Results

Setting (°C)	HOT BLOCK		Temperature Distribution	
	Reading (°C)		Stability (± °C)	Uncertainty (± °C)
	Min, Max	Average		
150.0	150, 150.1	150.0	0.20	0.83

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95 %.

Approved By. _____



Calibration Report

Measurement Results

Calibration Point	Average Standard Reading at each position (°C)											
	TN21	TN22	TN23	TN24	TN25	TN26	TN27	TN28	TN29	TN30	TN31	TN32
Point Setting	Max	150.38	149.73	150.12	150.36	150.56	150.00	150.48	150.25	150.56	149.59	149.59
150	Min	150.13	149.47	149.87	150.16	150.31	149.77	150.25	150.02	149.41	149.41	149.41
Average	150.23	149.59	149.96	150.24	150.41	149.87	150.36	150.12	150.45	149.51	149.51	149.51
	TN31	TN32	TN33	TN34	TN35	TN36	TN37	TN38	TN39	TN40		
Max	150.17	150.28	150.28	150.37	150.09	149.96	149.86	149.75	150.63	150.13		
Min	149.94	150.03	150.01	150.18	149.88	149.69	149.68	149.57	150.41	149.96		
Average	150.04	150.14	150.13	150.27	149.98	149.81	149.77	149.65	150.57	150.03		
	TN21	TN22	TN23	TN24	TN25	TN26	TN27	TN28	TN29	TN30		
Max	150.28	150.18	149.87	149.57	150.18	149.90	150.59	149.66	150.39	150.08		
Min	150.00	149.94	149.67	149.39	149.88	149.58	150.32	149.34	150.11	149.84		
Average	150.14	150.07	149.77	149.49	150.04	149.75	150.48	149.52	150.26	149.97		
	TN31	TN32	TN33	TN34	TN35	TN36	TN37	TN38	TN39	TN40		
Max	150.38	149.71	150.18	149.97	150.03	150.05	150.21	150.07	150.02	149.92		
Min	150.12	149.49	149.87	149.66	149.71	149.71	149.89	149.79	149.76	149.73		
Average	150.26	149.61	150.04	149.82	149.90	149.89	150.05	149.94	149.91	149.84		
	TN21	TN22	TN23	TN24	TN25	TN26	TN27	TN28	TN29	TN30		
Max	150.37	150.20	150.20	150.44	150.67	149.85	150.31	149.90	150.36	149.62		
Min	150.11	149.99	150.04	150.26	150.49	149.69	150.12	149.78	150.20	149.40		
Average	150.25	150.12	150.14	150.34	150.57	149.78	150.20	149.83	150.29	149.52		
	TN31	TN32	TN33	TN34	TN35	TN36						
Max	150.18	150.02	149.95	150.26	149.92	149.69						
Min	150.06	149.88	149.79	150.12	149.80	149.58						
Average	150.13	149.95	149.89	150.18	149.84	149.64						

Approved By. _____



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Certificate of Calibration

Certificate No. BSCC-UV-374/24

Number of Page(s) 2 of 3

Calibration Results:

1. Wavelength Accuracy

Certified Wavelength (nm)	UUC (nm)	Error (nm)	Uncertainty (nm)
241.70	241.55	-0.15	0.18
334.02	333.85	-0.17	0.18
418.53	418.57	0.04	0.18
572.99	572.97	-0.02	0.18
879.41	879.17	-0.24	0.18

2. Photometric Accuracy (UV)

Wavelength (nm)	Certified Absorbance (A)	UUC (A)	Error (A)	Uncertainty (±A)
235	0.0000	0.0000	0.0000	0.0075
257	0.7171	0.7169	-0.0002	0.0075
313	0.0000	0.0000	0.0000	0.0075
350	0.8354	0.8345	-0.0009	0.0075
	0.0000	0.0000	0.0000	0.0075
	0.2786	0.2781	-0.0005	0.0075
	0.0000	0.0000	0.0000	0.0075
	0.6199	0.6194	-0.0005	0.0075

*CNR = Customer not request

The above results are valid exclusively for the calibrated item(s) as mention in this report / certificate.
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FM-UV-708-02 Rev-01 (23/01/63)



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Certificate of Calibration

Number of Page(s) 1 of 3

Certificate No. BSCC-UV-374/24

Equipment UV/VIS Spectrophotometer

Model UV-1800

Manufacturer Shimadzu

Serial No. A11454908533 CD

ID No. BKK_EN0018

Date of receipt 13 September 2024

Date of calibration 13 September 2024

Date of issue 13 SEP 2024

Customer name

ALS Laboratory Group (Thailand) Co., Ltd.

Address

104 Soi Phattananakan 40, Phattananakan Road, Phattananakan, Suan Luang, Bangkok 10250

Temperature

(25.3 - 26.7) °C (On site)

Humidity

(50.4 - 55.9) %RH (On site)

Equipment condition

Good Operation

Calibration Location

Organic Preparation Lab

Calibration Procedure

In-house method WI-UV-702-01 based on ASTM E275-01

Traceability

Wavelength Accuracy is traceable to certificate No. 106372 and 106371

Photometric Accuracy is traceable to certificate No. 106364 and 111398

Stray Light is traceable to certificate No. 106377

The above certificate are traceable to SI unit through Siam Scientific Ltd.

(UKAS accredited calibration laboratory NO. 0659)

Calibrated by

Mr. Wanchana Janloey

Approved by

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FM-UV-708-02 Rev-01 (23/01/63)

สำเนาหนังสือใบอนุญาตขึ้นทะเบียน ห้องปฏิบัติการวิเคราะห์เอกชน



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Certificate of Calibration

Certificate No. BSCC-UV-374/24

Number of Page(s) 3 of 3

Calibration Results:

3. Photometric Accuracy (Visible)

Wavelength (nm)	Certified Absorbance (A)	UUC (A)	Error (A)	Uncertainty (±A)
420.0	0.0000	0.0000	0.0000	0.0042
	0.5761	0.5765	0.0004	0.0042
	0.7119	0.7105	-0.0014	0.0042
	1.0189	1.0174	-0.0015	0.0042
440.0	0.0000	0.0000	0.0000	0.0042
	0.5610	0.5613	0.0003	0.0042
	0.7001	0.6984	-0.0017	0.0042
	1.0026	1.0011	-0.0015	0.0042
465.0	0.0000	0.0000	0.0000	0.0042
	0.5235	0.5232	-0.0003	0.0042
	0.6614	0.6598	-0.0016	0.0042
	0.9456	0.9444	-0.0012	0.0042
546.1	0.0000	0.0000	0.0000	0.0042
	0.5249	0.5245	-0.0004	0.0042
	0.6975	0.6956	-0.0019	0.0042
	1.0009	0.9994	-0.0015	0.0042
590.0	0.0000	0.0000	0.0000	0.0042
	0.5590	0.5586	-0.0004	0.0042
	0.7725	0.7708	-0.0017	0.0042
	1.1125	1.1114	-0.0011	0.0042
635.0	0.0000	0.0000	0.0000	0.0042
	0.5666	0.5666	0.0000	0.0042
	0.7620	0.7604	-0.0016	0.0042
	1.0982	1.0971	-0.0011	0.0042

*CNR = Customer not request

4. Stray Light*

Standard cut-off wavelength (nm)	Unit Under Calibration(UUC)	
	Wavelength (nm)	Absorbance (A)
200.85±0.11nm	199.58	2.0217

The Stray Light transmission reference is less than 1.0%T and Stray light absorbance reference is greater than 2.00A
*Stray Light not NSC-ONSC Accredited.

The measurement uncertainty is base on a standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95%.

End of Certificate

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สิ่งที่ส่งมาด้วย ๑

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แล็บอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๒๐๔
ที่ อก ๐๓๐๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย

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รวม



ที่ อก ๐๓๐๐(๑)/ ๑๖๑๖๘

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๐ พฤศจิกายน ๒๕๖๖

เรื่อง ต่ออายุหนังสือขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แล็บอราทอรี กรุ๊ป (ประเทศไทย) จำกัด
อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขีดความสามารถห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๔ สิงหาคม ๒๕๖๖

- สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น
๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ แผ่น
๓. ขอบข่ายสารเคมีพิชที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แล็บอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ขอยพัฒนาการ ๔๐
ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แล็บอราทอรี กรุ๊ป (ประเทศไทย) จำกัด
ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้
ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย ตามสิ่งที่ส่งมาด้วย ๑
ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ ๑๘๑ ราย ตามสิ่งที่ส่งมาด้วย ๒
ค. ขอบข่ายสารเคมีพิชที่ได้รับขึ้นทะเบียนไว้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย สิ่งปฏิกูล
หรือวัสดุที่ไม่ใช้แล้ว และดิน ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ กันยายน ๒๕๖๙ หากประสงค์จะต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่อเอกสารประกอบคำขอต่อ
กรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นสุดของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ทั้งนำเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



กองวิจัยและเตือนภัยมลพิษโรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบแลพิชและทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕
โทรสาร ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๕๙
ไปรษณีย์อิเล็กทรอนิกส์ saraban@dlw.mail.go.th



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เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แล็บราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔
ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๔๑ ราย

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เอกสารแนบท้ายหนังสือรับซื้อยาขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แล็บส์ จำกัด (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔
ที่ อก ๐๓๐๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๗๔ รายการ
นี้เสีย จำนวน ๕0 รายการ

ลำดับที่	สารมลพิษ	วิธีการหาที่
1	Aldicarb	High-Performance Liquid Chromatographic Method ^[4]
2	Aldicarb Sulfone	High-Performance Liquid Chromatographic Method ^[4]
3	Aldicarb Sulfoxide	High-Performance Liquid Chromatographic Method ^[4]
4	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
5	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
6	Barium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
7	α-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
8	β-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
9	δ-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
10	γ-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
11	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method ^[4] 2) 5-Day BOD Test, Membrane Electrode Method ^[4]
12	Carbaryl	High-Performance Liquid Chromatographic Method ^[4]
13	Carbofuran	High-Performance Liquid Chromatographic Method ^[4]
14	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
15	Chemical Oxygen Demand	1) Closed Reflux, Colorimetric Method ^[4] 2) Closed Reflux, Titrimetric Method ^[4]
16	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
17	Chromium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
18	Color	ADMI Weighted-Ordinate Spectrophotometric Method ^[4]

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ลำดับที่	สารเคมี	วิธีวิเคราะห์
40	Manganese	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
41	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass spectrometric Method ⁽⁴⁾
42	Methiocarb	High-Performance Liquid Chromatographic Method ⁽⁴⁾
43	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
44	Methomyl	High-Performance Liquid Chromatographic Method ⁽⁴⁾
45	Nickel	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
46	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method ⁽⁴⁾ 2) Soxhlet Extraction Method ⁽⁴⁾
47	Oxamyl	High-Performance Liquid Chromatographic Method ⁽⁴⁾
48	Propoxur	High-Performance Liquid Chromatographic Method ⁽⁴⁾
49	pH	Electrometric Method ⁽⁴⁾
50	Phenols	1) Distillation, Chloroform Extraction Method ⁽⁴⁾ 2) Distillation, Direct Photometric Method ⁽⁴⁾
51	Selenium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
52	Sulfide	Iodometric Method ⁽⁴⁾
53	Temperature	Laboratory and Field Methods ⁽⁴⁾
54	Total Dissolved Solids	Dried at 180 °C ⁽⁴⁾
55	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method ⁽⁴⁾
56	Total Phosphorous	Digestion, Colorimetric Method ⁽⁴⁾
57	Total Suspended Solids	Dried from 103-105 °C ⁽⁴⁾
58	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
59	Trivalent Chromium	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ⁽⁴⁾
60	Zinc	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁴⁾

ลำดับที่	สารเคมี	วิธีวิเคราะห์
19	Copper	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
20	Cyanide	Distillation, Colorimetric Method ⁽⁴⁾
21	2,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
22	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
23	2,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
24	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
25	2,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
26	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
27	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
28	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
29	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
30	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
31	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
32	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
33	Formaldehyde	Distillation, Colorimetric Method ⁽³⁾
34	Free Chlorine	1) DPD Ferrous Titrimetric Method ⁽⁴⁾ 2) DPD Colorimetric Method ⁽⁴⁾
35	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
36	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
37	Hexavalent Chromium	Colorimetric Method ⁽⁴⁾
38	3-Hydroxycarbofuran	High-Performance Liquid Chromatographic Method ⁽⁴⁾
39	Lead	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾

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ลำดับที่	สารเคมี	วิธีวิเคราะห์
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
27	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ^(a)
35	Chromium (VI)	Colorimetric Method ^(a)

36

36 Chrysene...

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น้ำดื่ม จำนวน 126 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
3	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
8	Barium	Mass Spectrometric Method ^(a) 1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
9	Benz(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
13	Benzic Acid	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
15	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)

37

18 Bis(2-ethylhexyl)phthalate...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
57	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
58	Diethyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
63	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
64	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
65	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
69	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
70	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
74	α-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
75	β-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)

3mg/L

ลำดับที่	สารเคมี	วิธีวิเคราะห์
36	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
37	Cyanide	Distillation, Colorimetric Method ^(a)
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
39	DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
40	DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
41	DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
42	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
43	Di-n-Butyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
47	3,3-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)

3mg/L

ลำดับที่	สารเคมี	วิธีวิเคราะห์
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
95	N-Nitrosodi-n-Propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
96	Polychlorinated Biphenyls - PCB 1016 - PCB 1221 - PCB 1232 - PCB 1242 - PCB 1248 - PCB 1254 - PCB 1260	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
98	pH	Electrometric Method ^(a)
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
100	Phenol	1) Distillation, Chloroform Extraction Method ^(a) 2) Distillation, Direct Photometric Method ^(a) 3) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
102	Selenium	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
103	Silver	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
104	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
105	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
106	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
107	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
108	Toxaphene	Mass Spectrometric Method ^(a)
109	TPH (C ₅ -C ₉)	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a,25)

Smol

ลำดับที่	สารเคมี	วิธีวิเคราะห์
76	γ-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
81	Lead	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
83	Mercury	1) Digestion, Cold Vapor Atomic Absorption Spectrometric Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
84	Methanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
86	Methyl bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
87	Methylene chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
90	Methyl tert-butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(a)
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ^(a) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(a)
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(a)

Smol

อากาศเสีย (ต่อเนื่อง) จำนวน 28 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[5]
2	Arsenic	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[5]
3	Beryllium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[5]
4	Cadmium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[5]
5	Carbon Monoxide	1) Instrumental Analyzer Method ^[5] 2) Sampling Bag Non-Dispersive Infrared Method ^[5]
6	Chlorine	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
7	Chromium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[5]
8	Cobalt	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[5]
9	Copper	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[5]
10	Cresol	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[5] 2) Adsorption Sampling, Gas Chromatographic Method ^[5]
11	Dioxins	Isokinetic Sampling ^[5]
12	Hydrogen Chloride	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
13	Hydrogen Fluoride	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
14	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[5]

ลำดับที่	สารเคมี	วิธีวิเคราะห์
110	TPH (C ₈ -C ₁₆)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[8,22]
111	TPH (C ₁₆ -C ₃₃)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[8,22]
112	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[6]
113	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[6]
114	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[6]
115	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[6]
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[6]
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[6]
118	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[6]
119	Vanadium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[6]
120	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[6]
121	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[6]
122	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[6]
123	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[6]
124	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[6]
125	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[6]
126	Zinc	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[6]

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อากาศเสีย...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
27	Vanadium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[5]
28	Xylene	Adsorption Sampling, Gas Chromatographic Method ^[5]

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 35 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1.2.24] 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10.26] 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11.26]
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1.6.16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1.6.17] 3) Digestion, Inductively Coupled Plasma Method ^[7.16] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7.17]
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1.6.16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1.6.17] 3) Digestion, Inductively Coupled Plasma Method ^[7.16] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7.17]
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1.6.16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1.6.17] 3) Digestion, Inductively Coupled Plasma Method ^[7.16] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7.17]

Small

5 Beryllium...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
15	Lead	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[5]
16	Manganese	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[5]
17	Mercury	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[5] 2) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^[5]
18	Nickel	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[5]
19	Opacity	Ringelmann's Method ^[2]
20	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ^[5] 2) Absorption Sampling, Alkaline Permanganate/Colorimetric Method ^[5] 3) Instrumental Analyzer Method ^[5]
21	Selenium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[5]
22	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ^[5] 2) Instrumental Analyzer Method ^[5]
23	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ^[5]
24	Tellurium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[5]
25	Tin	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[5]
26	Total Suspended Particulate	1) Isokinetic Sampling, Gravimetric Method ^[5] 2) Paired Train, Isokinetic Sampling, Gravimetric Method ^[5]

Small

27 Vanadium...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^(1.6.19) 2) Alkaline Digestion, Colorimetric Method ^(8.19)
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)

ลำดับที่	สารเคมี	วิธีวิเคราะห์
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)
8	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
9	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1.6.16,19) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1.6.17,19) 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7.8,16,19) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7.8,17,19)

2) Soxhlet...

10 Chromium (VI)...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(1.6.20) 2) Waste Extraction, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^(1.6.30) 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽²⁰⁾ 4) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽³⁰⁾ 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ⁽²¹⁾ 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.28) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.28) 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.28) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.28)
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.28) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.28)
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.28) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.28)
25	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17) 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
26	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
27	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.28) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(11.28)

ลำดับที่	สารเคมี	วิธีวิเคราะห์
17	Dieldrin	2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.28) 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.28) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.28)
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.28) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.28) 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.28) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.28)
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.28) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.28) 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.28) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.28)
20	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.28) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.28)

ลำดับที่	สารเคมี	วิธีวิเคราะห์
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
33	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26)
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
35	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)

31ml

ลำดับที่	สารเคมี	วิธีวิเคราะห์
28	- 2-Chlorobiphenyl - 2,3-Dichlorobiphenyl - 2,2',5-Trichlorobiphenyl - 2,4',5-Trichlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',4',6-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,5,5',6-Hexachlorobiphenyl Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5,6-Heptachlorobiphenyl - 2,2',3,4,4',5,5',6-Heptachlorobiphenyl Nonachlorobiphenyl Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10.26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11.26) Electrometric Method ^(23.24) 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.17) 3) Digestion, Inductively Coupled Plasma Method ^(7.16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.17)
29	pH	
30	Selenium	

31ml

ลำดับที่	สารเคมี	วิธีวิเคราะห์
11	Benzo(b)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
12	Benzo(k)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
13	Benzoic acid	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
14	Benzo(a)pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
15	Benzo(g,h,i)perylene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
17	Bis(2-chloroethyl)ether	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
18	Bis(2-ethylhexyl)phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
19	Bromodichloromethane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
21	Butanol	Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^(13,25) Mass Spectrometric Method ^(13,25)
22	Butyl Benzyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

23 Cadmium...

ดิน จำนวน 125 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Acenaphthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
2	Acetone	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25) 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ⁽¹³⁾
3	Aldrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
4	Anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
8	Barium	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
9	Benz(a)anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)

11 Benzo(b)fluoranthene

ลำดับที่	สารเคมี	วิธีการวิเคราะห์
36	Chrysene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26] Extraction, Distillation, Colorimetric Method ^[27,28,29]
37	Cyanide	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26]
38	2,4-D	2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
39	DDD	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
40	DDE	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
41	DDT	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
42	Dibenz(a,h)anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
43	Di-n-Butyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
44	1,2-Dichlorobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26] Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[15,25]
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[15,25]
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[15,25]
47	3,3-Dichlorobenzidine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,26]
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[15,25]

ลำดับที่	สารเคมี	วิธีวิเคราะห์
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
24	Carbazole	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
27	Chlordane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
28	p-Chloroaniline	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
32	2-Chlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7&16,19) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7&17,19)
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^(8,19)

ลำดับที่	สารเคมี	วิธีวิเคราะห์
63	Di-n-Octyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
64	Endosulfan	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
65	Endrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
66	Ethylbenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
67	Fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
68	Fluorene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
69	Heptachlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
70	Heptachlor epoxide	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
71	Hexachlorobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
72	Hexachloro-1,3-butadiene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
73	n-Hexane	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25) 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ⁽¹³⁾

73 n-Hexane...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
53	2,4-Dichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
57	Dieldrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
58	Diethyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
59	2,4-Dimethylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
60	2,4-Dinitrophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
61	2,4-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
62	2,6-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

63 Di-n-Octyl Phthalate...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
99	Phenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
100	Pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
101	Selenium	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
102	Silver	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
103	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
108	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
109	TPH (C ₈ -C ₁₆)	1) Automate Extraction, Gas Chromatographic Method ^(12,21) 2) Solvent Extraction, Gas Chromatographic Method ^(12,22) 3) Ultrasonic Extraction, Gas Chromatographic Method ^(23,31)
110	TPH (C ₁₆ - C ₃₅)	1) Automate Extraction, Gas Chromatographic Method ^(11,22) 2) Solvent Extraction, Gas Chromatographic Method ^(12,22) 3) Ultrasonic Extraction, Gas Chromatographic Method ^(23,31)
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)

115 2,4,5-Trichlorophenol...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
96	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 2-Chlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',4',6-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,5,5',6'- Hexachlorobiphenyl - 2,2',4,4',5,5'- Hexachlorobiphenyl - 2,2',3,3',4,4',5'- Heptachlorobiphenyl - 2,2',3,4,4',5,5'- Heptachlorobiphenyl - 2,2',3,4,4',5',6'- Heptachlorobiphenyl - 2,2',3,4',5,5',6'- Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6'- Nonachlorobiphenyl Pentachlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26) 1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
97	Phenanthrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
98		1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

99 Phenol...

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20. United States...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
115	2,4,5-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
116	2,4,6-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,23)
118	Vanadium	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
119	Vinyl Acetate	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,23)
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,23)
121	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,23)
122	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,23)
123	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,23)
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,23)
125	Zinc	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)

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ที่ ออ ๐๓๑๐(๑)/ ๔ ๑ ๑ ๑

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๕ เมษายน ๒๕๖๗

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์
เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด
อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอใบสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๔ มีนาคม ๒๕๖๗

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เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

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๒. ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๑๒ ราย

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อนึ่ง หนังสือฉบับนี้...

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ที่ ก ๐๓๑๐(๑)/ ๑ ๒ ๖ ๘ /

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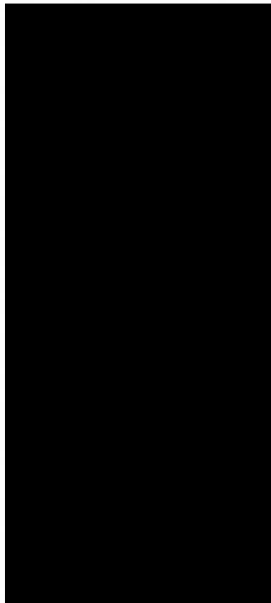
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เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์
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จำนวน ๘ ราย ได้แก่

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จึงเรียนมาเพื่อทราบ

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