



Certificate No. : LN2346-201112

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

National Measurement Laboratory, R.O.C.
National Measurement Laboratory, R.O.C.(Chemical)
321, Sec. 2, Kuang Fu Rd., Hsinchu, Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria : ISO/IEC 17025:2017 ; CNS 17025:2018
Accreditation Number : N2346
Originally Accredited : December 29, 2010
Effective Period : December 29, 2020 to December 28, 2025
Accredited Scope : Calibration Field, see described in the Appendix
Specific Accreditation Program : Accreditation Program for National Metrology Institutes



Ching-Chang Lien
President, Taiwan Accreditation Foundation
Date : November 12, 2020

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President, Taiwan Accreditation Foundation
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Accreditation Number : N2346

Laboratory Head : LIN, Tzeng-Yow

Chemical

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KI4000 NO, SO ₂ (Cylinder Gas)	Standard gas: NMIs/NO, SO ₂	Instrument Calibration Technique for the Component Concentration of Cylinder Gas (Document No.: 07-3-91-0035)	50	μmol/mol	2000	μmol/mol	NO/N ₂	0.89	μmol/mol
			50	μmol/mol	2000	μmol/mol	SO ₂ /N ₂	0.82	μmol/mol
KI4000 C ₂ H ₅ OH (Cylinder Gas)	Standard gas: NMIs /C ₂ H ₅ OH	Instrument Calibration Technique for the Component Concentration of Cylinder Gas (Document No.: 07-3-91-0035)	137	μmol/mol	137	μmol/mol		1.7	μmol/mol
			301	μmol/mol	301	μmol/mol		3.2	μmol/mol
			547	μmol/mol	547	μmol/mol		4.3	μmol/mol

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
			mini mum value	units	maxi mum value	units		explanation	value
KI4000 CO, CO ₂ , CH ₄ , C ₃ H ₈ (Cylinder Gas)	Standard gas: NMIs/CO, CO ₂ , CH ₄ , C ₃ H ₈	Instrument Calibration Technique for the Component Concentration of Cylinder Gas (Document No.: 07-3 -91-0035)	10	μmol /mol	1000	μmol /mol	CO	0.08	μmol /mol
			100	μmol /mol	1000	μmol /mol	CO ₂	1.1	μmol /mol
			100	μmol /mol	1000	μmol /mol	CH ₄	0.9	μmol /mol
			100	μmol /mol	1000	μmol /mol	C ₃ H ₈	1.0	μmol /mol
KI4000 CO, CO ₂ , CH ₄ , C ₃ H ₈ , CF ₄ , SF ₆ , NO, SO ₂ , O ₂ (Cylinder Gas)	Standard gas: NMIs/CO, CO ₂ , CH ₄ , C ₃ H ₈ , CF ₄ , SF ₆ , NO, SO ₂ , O ₂	Instrument Certification Technique for Filling Mass Cylinder Gases and Concentration of Gas Mixtures -Gravimetric Method (Document No.: 07-3-A3 -0179)	1	μmol /mol	100	μmol /mol	CO/N ₂	1.0	%
			> 0.1	mmol /mol	100	mmol /mol	CO/N ₂	0.2	%
			100	μmol /mol	1000	μmol /mol	CO ₂ /N ₂	0.2	%
			> 1	mmol /mol	160	mmol /mol	CO ₂ /N ₂	0.1	%
			100	μmol /mol	1000	μmol /mol	CH ₄ /N ₂	0.8	%
			> 1	mmol /mol	100	mmol /mol	CH ₄ /N ₂	0.1	%
			0.1	mmol /mol	50	mmol /mol	C ₃ H ₈ /N ₂	0.5	%
			100	μmol /mol	3000	μmol /mol	CF ₄ /N ₂	0.3	%
			10	μmol /mol	1000	μmol /mol	SF ₆ /N ₂	0.5	%
			50	μmol /mol	2000	μmol /mol	NO/N ₂	0.8	%
			50	μmol /mol	2000	μmol /mol	SO ₂ /N ₂	0.5	%
			1	μmol /mol	10	μmol /mol	O ₂ /N ₂	1.5	%
			1	mmol /mol	10	mmol /mol	O ₂ /N ₂	0.5	%
> 10	mmol /mol	250	mmol /mol	O ₂ /N ₂	0.3	%			

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KI4000 CO, CO ₂ , CH ₄ , C ₃ H ₈ , CF ₄ , SF ₆ , NO, SO ₂ , O ₂ (Cylinder Gas)	Standard gas: NMIs /CO, CO ₂ , CH ₄ , C ₃ H ₈ , CF ₄ , SF ₆ , NO, SO ₂ , O ₂	Instrument Certification Technique for Filling Mass Cylinder Gases and Concentration of Gas Mixtures -Gravimetric Method (Document No.: 07-3-A3-0179)	1	mmol /mol	20	mmol /mol	CH ₄ /air	0.3	%
KI4000 CO, CO ₂ , CH ₄ , C ₃ H ₈ , O ₂ (Cylinder Gas)	Standard gas: NMIs /CO, CO ₂ , CH ₄ , C ₃ H ₈ , O ₂	Instrument Calibration Technique for the Component Concentration of Cylinder Gas (Document No.: 07-3-91-0035)	1000	μmol /mol	10000	μmol /mol	CO	9	μmol /mol
			> 10000	μmol /mol	200000	μmol /mol	CO	90	μmol /mol
			1000	μmol /mol	10000	μmol /mol	CO ₂	12	μmol /mol
			>10000	μmol /mol	300000	μmol /mol	CO ₂	120	μmol /mol
			1000	μmol /mol	10000	μmol /mol	CH ₄	8	μmol /mol
			>10000	μmol /mol	100000	μmol /mol	CH ₄	80	μmol /mol
			1000	μmol /mol	10000	μmol /mol	C ₃ H ₈	6	μmol /mol
			>10000	μmol /mol	50000	μmol /mol	C ₃ H ₈	60	μmol /mol
			1000	μmol /mol	10000	μmol /mol	O ₂	12	μmol /mol
			>10000	μmol /mol	250000	μmol /mol	O ₂	120	μmol /mol

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KI4000 Synthetic Natural Gas (Cylinder Gas)	Standard gas: NMIs /Synthetic Natural Gas	Instrument Calibration Technique for the Component Concentration of Natural Gas (Document No.: 07-3-A1-0028)	0.1	cmol /mol	95	cmol /mol	CH ₄	0.18	cmol /mol
			0.1	cmol /mol	10	cmol /mol	C ₂ H ₆	0.017	cmol /mol
			0.1	cmol /mol	10	cmol /mol	C ₃ H ₈	0.012	cmol /mol
			0.01	cmol /mol	1.0	cmol /mol	iso-C ₄ H ₁₀	0.0012	cmol /mol
			0.01	cmol /mol	1.0	cmol /mol	n-C ₄ H ₁₀	0.0012	cmol /mol
			0.01	cmol /mol	0.2	cmol /mol	neo-C ₅ H ₁₂	0.00013	cmol /mol
			0.01	cmol /mol	0.3	cmol /mol	iso-C ₅ H ₁₂	0.0005	cmol /mol
			0.01	cmol /mol	0.3	cmol /mol	n-C ₅ H ₁₂	0.0006	cmol /mol
			0.01	cmol /mol	0.1	cmol /mol	n-C ₆ H ₁₄	0.00031	cmol /mol
			0.01	cmol /mol	50	cmol /mol	N ₂	0.0038	cmol /mol
			0.01	cmol /mol	20	cmol /mol	CO ₂	0.008	cmol /mol
KI6000 Gas Monitor, Gas Alarm, Gas Detector	Standard gas: NMIs /CO, CO ₂ , CH ₄ , C ₃ H ₈	Instrument Calibration Technique for Gas Measurement System-Gas Monitor (Document No.: 07-3-91-0072)	0.0	mol /mol	0.1	mol /mol	CO	2	μmol /mol
			0	mol /mol	1	mol /mol	CO ₂	6	μmol /mol
			0.00 (0)	mol /mol (%LEL)	0.05 (100)	mol /mol (%LEL)	CH ₄	59 (0.1)	μmol /mol (%LEL)
			0.00 (0)	mol /mol (%LEL)	0.02 (100)	mol /mol (%LEL)	C ₃ H ₈	26 (0.1)	μmol /mol (%LEL)

calibration items	working standard	calibration method	measurand level or range				measurement conditions /independent variable	smallest uncertainty	
	brand /model	document name /no.	minimum value	units	maximum value	units	explanation	value	units
KI6000 Gas Concentration Dilution Device (CO, CO ₂ , CH ₄)	Standard gas: NMIs /CO, CO ₂ , CH ₄	Instrument Calibration Technique for the Concentration Calibration of Gas Dilutor-Gas Chromatography (Document No.: 07-3-A3-0185)	0	%	100	%	CO ₂ /N ₂ @ (50 to 500) μmol/mol	0.03	%
			0	%	100	%	CO/N ₂ @ (1 to 100) μmol/mol	0.02	%
			0	%	100	%	CH ₄ /air@ (1000 to 20000) μmol/mol	0.15	%
KI7000 Gas Analyzer	Standard gas: NMIs /CO, CO ₂ , CH ₄ , C ₃ H ₈	Instrument Calibration Technique for Gas Measurement System -Gas Monitor (Document No.: 07-3-91-0072)	0.0	mol /mol	0.1	mol /mol	CO	2	μmol /mol
			0	mol /mol	1	mol /mol	CO ₂	6	μmol /mol
			0.00 (0)	mol /mol (%LEL)	0.05 (100)	mol /mol (%LEL)	CH ₄	59 (0.1)	μmol /mol (%LEL)
			0.00 (0)	mol /mol (%LEL)	0.02 (100)	mol /mol (%LEL)	C ₃ H ₈	26 (0.1)	μmol /mol (%LEL)
KI7000 Gas Concentration Dilution Device (CO, CO ₂ , CH ₄)	Standard gas: NMIs /CO, CO ₂ , CH ₄	Instrument Calibration Technique for the Concentration Calibration of Gas Dilutor-Gas Chromatography (Document No.: 07-3-A3-0185)	0	%	100	%	CO ₂ /N ₂ @ (50 to 500) μmol/mol	0.03	%
			0	%	100	%	CO/N ₂ @ (1 to 100) μmol/mol	0.02	%
			0	%	100	%	CH ₄ /air @ (1000 to 20000) μmol/mol	0.15	%

Note : Smallest uncertainty represents an expanded uncertainty using a coverage factor approximately 95 % level of confidence.

Approval Signatory

Approval Signatory	Scope
LIN, Tsai-Yin	KI4000, KI6000, KI7000
HUANG, Chiung-Kun	KI4000, KI6000, KI7000
LIU, Hsin-Wang	KI4000, KI6000, KI7000

(Null Below)