

Amount of substance, Gases, Japan, NMIJ (National Metrology Institute of Japan), CERI (Chemicals Evaluation and Research Institute)

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The expanded uncertainties correspond to $k = 2$ (level of confidence 95%)

NMI Service Identifier	Measurement Service Sub-Category	Matrix	Measurand		Dissemination Range of Measurement Capability			Range of Expanded Uncertainties as Disseminated				Range of Certified Values in Reference Materials			Range of Expanded Uncertainties for Certified Value				Mechanism(s) for Measurement Service Delivery	Comments	Service provider
			Analyte or Component	Quantity	From	To	Unit	From	To	Unit	Is the expanded uncertainty a relative one?	From	To	Unit	From	To	Unit	Is the expanded uncertainty a relative one?			
340015	Environmental	nitrogen	sulfide hexafluoride	Amount-of-substance fraction	80	100000	μmol/mol	1.5	0.5	%	Yes	80	10000	μmol/mol	0.4	0.6	%	Yes	NMIJ CRM 4403	Approved on 07 November 2006	NMIJ
340016	Environmental	nitrogen	carbon tetrafluoride	Amount-of-substance fraction	80	100000	μmol/mol	1.5	0.5	%	Yes	80	10000	μmol/mol	0.4	0.6	%	Yes	NMIJ CRM 4403	Approved on 07 November 2006	NMIJ
4400-05	Environmental	nitrogen	benzene	Amount-of-substance fraction	50	100000	nmol/mol	2	1	%	Yes	100	1000	nmol/mol	2	2	%	Yes	JCSS	Approved on 29 April 2005	CERI
			chloroform		50	100000	nmol/mol	2	1	%	Yes	100	1000	nmol/mol	2	2	%	Yes			
			dichloromethane		50	100000	nmol/mol	2	1	%	Yes	100	1000	nmol/mol	2	2	%	Yes			
			trichloroethylene		50	100000	nmol/mol	2	1	%	Yes	100	1000	nmol/mol	2	2	%	Yes			
			tetrachloroethylene		50	100000	nmol/mol	2	1	%	Yes	100	1000	nmol/mol	2	2	%	Yes			
			1,2-dichloroethane		50	100000	nmol/mol	3	2	%	Yes	100	1000	nmol/mol	3	3	%	Yes			
			1,3-butadiene		50	100000	nmol/mol	2	1	%	Yes	100	1000	nmol/mol	2	2	%	Yes			
			vinyl chloride		50	100000	nmol/mol	2	1	%	Yes	100	1000	nmol/mol	2	2	%	Yes			
440002	Environmental	nitrogen	benzene	Amount-of-substance fraction	20	100	nmol/mol	1.6	1.6	nmol/mol	No	100	1000	nmol/mol	2	1	%	Yes	JCSS	Approved on 29 April 2005	CERI
			toluene		20	100	nmol/mol	1	1	nmol/mol	No	100	1000	nmol/mol	2	1	%	Yes			
			m-xylene		20	100	nmol/mol	1	1	nmol/mol	No	100	1000	nmol/mol	2	1	%	Yes			
			o-xylene		20	100	nmol/mol	1	1	nmol/mol	No	100	1000	nmol/mol	2	1	%	Yes			
			ethylbenzene		20	100	nmol/mol	1	1	nmol/mol	No	100	1000	nmol/mol	2	1	%	Yes			
4403	Environmental	nitrogen	propane	Amount-of-substance fraction	150	15000	μmol/mol	0.6	0.6	%	Yes	150	15000	μmol/mol	0.6	0.6	%	Yes	JCSS	Approved on 29 April 2005	CERI
3402a	Environmental	nitrogen	carbon monoxide	Amount-of-substance fraction	3	50	μmol/mol	1	1	%	Yes	3	50	μmol/mol	1	1	%	Yes	JCSS	Approved on 29 April 2005	CERI
3402b	Environmental	nitrogen	carbon monoxide	Amount-of-substance fraction	51	150000	μmol/mol	0.6	0.6	%	Yes	51	150000	μmol/mol	0.6	0.6	%	Yes	JCSS	Approved on 29 April 2005	CERI
3403a	Environmental	nitrogen	carbon dioxide	Amount-of-substance fraction	3	180	μmol/mol	1	1	%	Yes	3	180	μmol/mol	1	1	%	Yes	JCSS	Approved on 29 April 2005	CERI

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NMI Service Identifier	Measurement Service Sub-Category	Matrix	Measurand		Dissemination Range of Measurement Capability			Range of Expanded Uncertainties as Disseminated				Range of Certified Values in Reference Materials			Range of Expanded Uncertainties for Certified Value				Mechanism(s) for Measurement Service Delivery	Comments	Service provider
			Analyte or Component	Quantity	From	To	Unit	From	To	Unit	Is the expanded uncertainty a relative one?	From	To	Unit	From	To	Unit	Is the expanded uncertainty a relative one?			
3403b	Environmental	nitrogen	carbon dioxide	Amount-of-substance fraction	181	160000	μmol/mol	0.6	0.6	%	Yes	181	160000	μmol/mol	0.6	0.6	%	Yes	JCSS	Approved on 29 April 2005	CERI
3405d	Environmental	nitrogen	nitric oxide	Amount-of-substance fraction	31	50000	μmol/mol	0.6	0.6	%	Yes	31	50000	μmol/mol	0.6	0.6	%	Yes	JCSS	Approved on 29 April 2005	CERI
3404d	Environmental	nitrogen	sulfur dioxide	Amount-of-substance fraction	51	10000	μmol/mol	0.6	0.6	%	Yes	51	10000	μmol/mol	0.6	0.6	%	Yes	JCSS	Approved on 29 April 2005	CERI
4401a	Environmental	nitrogen	ethanol	Amount-of-substance fraction	100	500	μmol/mol	1.5	1.5	%	Yes	100	500	μmol/mol	1.5	1.5	%	Yes	JCSS	Approved on 29 April 2005	CERI
4401a	Forensic	nitrogen	ethanol	Amount-of-substance fraction	100	500	μmol/mol	1.5	1.5	%	Yes	100	500	μmol/mol	1.5	1.5	%	Yes	JCSS	Approved on 29 April 2005	CERI
4401b	Environmental	synthetic air	ethanol	Amount-of-substance fraction	100	500	μmol/mol	1.5	1.5	%	Yes	100	500	μmol/mol	1.5	1.5	%	Yes	JCSS	Approved on 29 April 2005	CERI
4401b	Forensic	synthetic air	ethanol	Amount-of-substance fraction	100	500	μmol/mol	1.5	1.5	%	Yes	100	500	μmol/mol	1.5	1.5	%	Yes	JCSS	Approved on 29 April 2005	CERI
3407a	Fuel	nitrogen	oxygen	Amount-of-substance fraction	9000	250000	μmol/mol	0.6	0.6	%	Yes	9000	250000	μmol/mol	0.6	0.6	%	Yes	JCSS	Approved on 29 April 2005	CERI
3408a	Environmental	synthetic air	nitric dioxide	Amount-of-substance fraction	5	50	μmol/mol	3	3	%	Yes	5	50	μmol/mol	3	3	%	Yes	JCSS	Approved on 29 April 2005	CERI
4400-03	Environmental	nitrogen	p-xylene	Amount-of-substance fraction	0.7	50	μmol/mol	2	1	%	Yes	0.7	1.5	μmol/mol	2	2	%	Yes	NMIJ-CRM 4401	Approved on 24 January 2006	NMIJ
			1,1,1-trichloro ethane		0.7	50	μmol/mol	2	1	%	Yes	0.7	1.5	μmol/mol	1.5	1.5	%	Yes			
			cis-1,2-dichloroethylene		0.7	50	μmol/mol	2	1	%	Yes	0.7	1.5	μmol/mol	1.5	1.5	%	Yes			
4400-04	Environmental	nitrogen	1,1,1-trichloro ethane	Amount-of-substance fraction	50	700	nmol/mol	3	2	%	Yes	70	150	nmol/mol	2	2	%	Yes	NMIJ-CRM 4402	Approved on 24 January 2006	NMIJ
			c-1,2-dichloro ethylene		50	700	nmol/mol	3	2	%	Yes	70	150	nmol/mol	2	2	%	Yes			

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			Analyte or Component	Quantity	From	To	Unit	From	To	Unit	Is the expanded uncertainty a relative one?	From	To	Unit	From	To	Unit	Is the expanded uncertainty a relative one?			
4401	Environmental	synthetic air	methane	Amount-of-substance fraction	1	50	µmol/mol	0.6	0.6	%	Yes	1	50	µmol/mol	0.6	0.6	%	Yes	JCSS	Approved on 24 January 2006	CERI
4402	Environmental	synthetic air	propane	Amount-of-substance fraction	3.5	500	µmol/mol	0.6	0.6	%	Yes	3.5	500	µmol/mol	0.6	0.6	%	Yes	JCSS	Approved on 24 January 2006	CERI
3405a	Environmental	nitrogen	nitric oxide	Amount-of-substance fraction	0.1	0.4	µmol/mol	5	5	%	Yes								JCSS	Approved on 24 January 2006	CERI
3405b	Environmental	nitrogen	nitric oxide	Amount-of-substance fraction	0.5	1	µmol/mol	3	3	%	Yes								JCSS	Approved on 24 January 2006	CERI
3405c	Environmental	nitrogen	nitric oxide	Amount-of-substance fraction	1.1	30	µmol/mol	1	1	%	Yes								JCSS	Approved on 24 January 2006	CERI
440001	Environmental	nitrogen	benzene	Amount-of-substance fraction	2	20	nmol/mol	0.9	0.9	nmol/mol	No								JCSS	Approved on 24 January 2006	CERI
			toluene		2	20	nmol/mol	0.7	0.7	nmol/mol	No										
			o-xylene		2	20	nmol/mol	0.7	0.7	nmol/mol	No										
340001	Fuel	methane	nitrogen	Amount-of-substance fraction	0.5E-02	2E-02	mol/mol	0.2	0.2	mmol/mol	No								Calibration	Approved on 24 January 2006	NMIJ
			carbon dioxide		0.5E-02	2E-02	mol/mol	0.1	0.1	mmol/mol	No										
			propane		2E-02	10E-02	mol/mol	0.3	0.3	mmol/mol	No										
3001	High-purity gas	nitric oxide	nitric oxide	Amount-of-substance fraction	0.99	1	mol/mol	0.01	1	%	Yes	0.99	1	mol/mol	0.01	1	%	Yes	NMIJ-CRM 3001	Approved on 24 January 2006	NMIJ
			nitrogen dioxide		10	10000	µmol/mol	10	2.5	%	Yes										
			nitrogen		11	5000	µmol/mol	5	0.5	%	Yes										
			oxygen		11	5000	µmol/mol	5	0.5	%	Yes										
			dinitrogen oxide		7.5	11000	µmol/mol	10	0.5	%	Yes										
			methane		2	11000	µmol/mol	10	0.5	%	Yes										
			propane		2	15000	µmol/mol	10	0.5	%	Yes										

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			Analyte or Component	Quantity	From	To	Unit	From	To	Unit	Is the expanded uncertainty a relative one?	From	To	Unit	From	To	Unit	Is the expanded uncertainty a relative one?			
3002	High-purity gas	sulfur dioxide	sulfur dioxide	Amount-of-substance fraction	0.99	1	mol/mol	0.01	1	%	Yes	0.99	1	mol/mol	0.01	1	%	Yes	NMIJ-CRM 3002	Approved on 24 January 2006	NMIJ
			carbon dioxide		11	15000	µmol/mol	5	0.5	%	Yes										
			nitrogen		11	15000	µmol/mol	5	0.5	%	Yes										
			oxygen		11	5000	µmol/mol	5	0.5	%	Yes										
			methane		2	11000	µmol/mol	10	0.5	%	Yes										
			propane		2	15000	µmol/mol	10	0.5	%	Yes										
340002	Other	nitrogen	oxygen	Amount-of-substance fraction	11	5000	µmol/mol	5	0.5	%	Yes								Calibration	Approved on 24 January 2006	NMIJ
340003	Other	helium	oxygen	Amount-of-substance fraction	11	15000	µmol/mol	5	0.5	%	Yes								Calibration	Approved on 24 January 2006	NMIJ
340004	Other	helium	nitrogen	Amount-of-substance fraction	11	15000	µmol/mol	5	0.5	%	Yes								Calibration	Approved on 24 January 2006	NMIJ
340005	Other	nitrogen	carbon dioxide	Amount-of-substance fraction	11	200	µmol/mol	5	1	%	Yes								Calibration	Approved on 24 January 2006	NMIJ
340006	Other	helium	carbon dioxide	Amount-of-substance fraction	11	15000	µmol/mol	5	0.5	%	Yes								Calibration	Approved on 24 January 2006	NMIJ
340007	Other	nitrogen	nitrogen dioxide	Amount-of-substance fraction	10	10000	µmol/mol	10	2.5	%	Yes								Calibration	Approved on 24 January 2006	NMIJ
340008	Other	helium	nitrogen dioxide	Amount-of-substance fraction	10	10000	µmol/mol	10	2.5	%	Yes								Calibration	Approved on 24 January 2006	NMIJ
340009	Other	nitrogen	dinitrogen oxide	Amount-of-substance fraction	7.5	11000	µmol/mol	10	0.5	%	Yes								Calibration	Approved on 24 January 2006	NMIJ
340010	Other	helium	dinitrogen oxide	Amount-of-substance fraction	7.5	11000	µmol/mol	10	0.5	%	Yes								Calibration	Approved on 24 January 2006	NMIJ

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			Analyte or Component	Quantity	From	To	Unit	From	To	Unit	Is the expanded uncertainty a relative one?	From	To	Unit	From	To	Unit	Is the expanded uncertainty a relative one?				
340011	Other	nitrogen	methane	Amount-of-substance fraction	2	11000	µmol/mol	10	0.5	%	Yes								Calibration	Approved on 24 January 2006	NMIJ	
340012	Other	helium	methane	Amount-of-substance fraction	2	11000	µmol/mol	10	0.5	%	Yes								Calibration	Approved on 24 January 2006	NMIJ	
340013	Other	nitrogen	propane	Amount-of-substance fraction	2	150	µmol/mol	10	1	%	Yes								Calibration	Approved on 24 January 2006	NMIJ	
340014	Other	helium	propane	Amount-of-substance fraction	2	15000	µmol/mol	10	0.5	%	Yes								Calibration	Approved on 24 January 2006	NMIJ	
3404a	Environmental	nitrogen	sulfur dioxide	Amount-of-substance fraction	0.1	0.4	µmol/mol	6	2.5	%	Yes								JCSS	Approved on 07 November 2006	CERI	
3404b	Environmental	nitrogen	sulfur dioxide	Amount-of-substance fraction	0.5	1	µmol/mol	2.5	2.5	%	Yes								JCSS	Approved on 07 November 2006	CERI	
3404c	Environmental	nitrogen	sulfur dioxide	Amount-of-substance fraction	1.1	50	µmol/mol	1	1	%	Yes								JCSS	Approved on 07 November 2006	CERI	
340017	Fuel	synthetic natural gas	nitrogen	Amount-of-substance fraction	5	200	mmol/mol	0.3	0.5	%	Yes								Calibration Service	Approved on 14 December 2006 Uncertainty Convention 1	NMIJ	
			carbon dioxide	Amount-of-substance fraction	5	100	mmol/mol	0.4	0.6	%	Yes											
			ethane	Amount-of-substance fraction	2	200	mmol/mol	0.3	0.5	%	Yes											
			propane	Amount-of-substance fraction	1	100	mmol/mol	0.3	0.5	%	Yes											
			n-butane	Amount-of-substance fraction	0.5	10	mmol/mol	0.3	0.5	%	Yes											

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			Analyte or Component	Quantity	From	To	Unit	From	To	Unit	Is the expanded uncertainty a relative one?	From	To	Unit	From	To	Unit	Is the expanded uncertainty a relative one?			
			iso-butane	Amount-of-substance fraction	0.5	10	mmol/mol	0.3	0.5	%	Yes										
			methane	Amount-of-substance fraction	600	980	mmol/mol	0.3	0.5	%	Yes										

JCSS: Japan Calibration Service System