Qatargas OPCO - South Operations
Onshore Operations Support - Laboratory

CORRELATION TEST - COMPARISON OF RESULTS

Sample	:	QG - CPC CORRELATION SAMPLE
Standard Cylinder No.	:	DL 6110
Location	:	Qatargas - South Laboratory
Analysis Date	:	19-Sep-2023
Analyst	:	MOHAMMED ABBAS
Analysis Method	:	GC, GPA 2261

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COMPONENT	Unit	GC System used			Max-Min	Conclusion	Correlation Limit [GPA 2261-64]
		AGILENT - SYSTEM-6	AGILENT - SYSTEM-7	AGILENT - SYSTEM-8			
CH4	% MOL	93.030	93.030	93.010	0.02	OK	0.30
C2H6	% MOL	6.270	6.270	6.290	0.02	OK	0.10
C3H8	% MOL	0.090	0.090	0.090	0.00	OK	0.05
I-C4H10	% MOL	0.000	0.000	0.000	0.00	OK	0.03
N-C4H10	% MOL	0.000	0.000	0.000	0.00	OK	0.03
I-C5H12	% MOL	0.000	0.000	0.000	0.00	OK	0.03
N-C5H12	% MOL	0.000	0.000	0.000	0.00	OK	0.03
C6H14	% MOL	0.000	0.000	0.000	0.00	OK	0.03
N2	% MOL	0.610	0.610	0.610	0.00	OK	0.03
CO2	% MOL	0.000	0.000	0.000	0.00	OK	0.03
O2	% MOL	0.000	0.000	0.000	0.00	OK	0.03
TOTAL	% MOL	100.000	100.000	100.000			

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CORRELATION SHEET FOR LNG CERTIFICATION

SAMPLE	REFERENCE STANDARD GAS	CORRELATION TEST SAMPLE
CYLINDER No.	5710175	DL 6110
SQC SAMPLE TYPE	NOT APPLICABLE	QG - CPC CORRELATION SAMPLE
LOCATION	QATARGAS SOUTH LAB. / AGILENT - SYSTEM-6	QATARGAS SOUTH LAB./ AGILENT - SYSTEM-6
GC MODEL	AGILENT 7890B	AGILENT 7890B
GC SERIAL No.	US 13493032	US 13493032
DATE CERTIFIED	12-May-22	19-Sep-23
SAMPLED BY	SCOTT SPECIALTY GASES	AGIN RASLAN
ANALYSIS DATE	19-Sep-23	19-Sep-23
ANALYST	MOHAMMED ABBAS	MOHAMMED ABBAS
ANALYSIS METHOD	GC, GPA 2261	GC, GPA 2261

COMPONENT	CERTIFICATE MOL% A	COUNT 1			COUNT 2			DIFF RESPONSE FACTOR H=(D-G)*100/I	AVERAGE RESPONSE FACTOR I=(D+G)/2	COUNT 1			COUNT 2			DIFF MOL% P=(L-O)*100/Q	TEST RESULT (MOL%)	
		SAMPLE PRESSURE B(mmHg)	PEAK AREA C	RESPONSE FACTOR D=A*B/C	SAMPLE PRESSURE E(mmHg)	PEAK AREA F	RESPONSE FACTOR G=A*E/F			SAMPLE PRESSURE J	PEAK AREA K	MOL% L=I*K/J	SAMPLE PRESSURE M	PEAK AREA N	MOL% O=I*N/M		UNORMALIZED Q=(L+O)/2	REPORTED VALUE
O2	0.0501	760	56	0.6799286	760	56	0.6799286	0.00	0.679928571	760	0	0.0000000	760	0	0.0000000	-	0.000	0.000
N2	0.8000	760	949	0.6406744	760	948	0.6413502	0.11	0.641012303	760	713	0.6013708	760	712	0.6005273	0.14	0.601	0.610
CH4	92.3300	760	80366	0.8731404	760	80215	0.8747840	0.19	0.873962200	760	80366	92.4169029	760	80267	92.3030578	0.12	92.360	93.030
C3H8	0.1180	760	10114	0.0088669	760	10111	0.0088695	0.03	0.008868233	760	7370	0.0859985	760	7364	0.0859285	0.08	0.086	0.090
I-C4H10	0.0513	760	6220	0.0062682	760	6221	0.0062672	0.02	0.006267663	760	0	0.0000000	760	0	0.0000000	-	0.000	0.000
N-C4H10	0.0314	760	3799	0.0062757	760	3799	0.0062757	0.00	0.006275651	760	0	0.0000000	760	0	0.0000000	-	0.000	0.000
I-C5H12	0.0500	760	7778	0.0048856	760	7783	0.0048824	0.06	0.004884005	760	0	0.0000000	760	0	0.0000000	-	0.000	0.000
N-C5H12	0.0499	760	7880	0.0048127	760	7883	0.0048109	0.04	0.004811775	760	0	0.0000000	760	0	0.0000000	-	0.000	0.000
CO2	0.1480	760	150	0.7498667	760	150	0.7498667	0.00	0.749866667	760	0	0.0000000	760	0	0.0000000	-	0.000	0.000
C2H6	6.3700	760	5106	0.9481394	760	5080	0.9529921	0.51	0.950565785	760	4980	6.2287074	760	4973	6.2199522	0.14	6.224	6.270
$C6H14^+$	0.0000	760	0	0.0000000	760	0	0.0000000	0.00	0.000000000	760	0	0.0000000	760	0	0.0000000	-	0.000	0.000
TOTAL	99.9987		122418			122246					93429	99.3329795		93316	99.2094658		99.271	100.000

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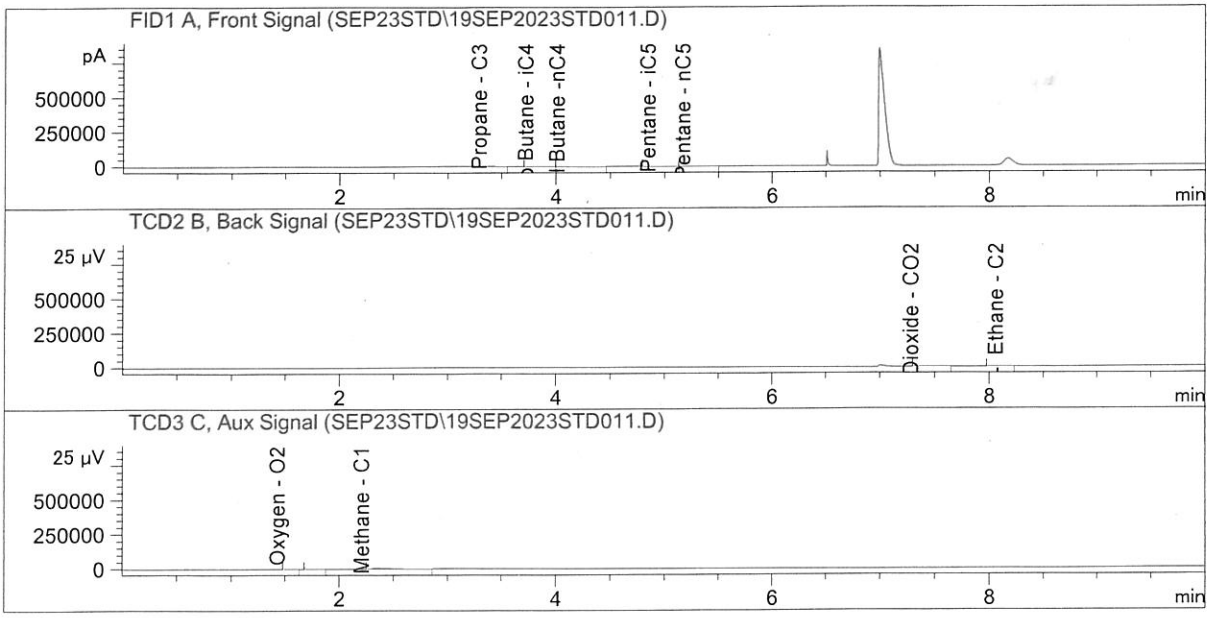
Method: C:\CHEM32\1\METHODS\SEP23_AGILENT6.M
File Name: C:\CHEM32\1\DATA\SEP23STD\19SEP2023STD011.D

Instrument: Agilent 6
Injection Date: Tue, 19. Sep. 2023 8:55:10 AM
Lab. Tech.: ABBAS

Sample Name: STANDARD
Sample Note: 760 mmHg



Name	Signal	RT(min)	Area	Amount
Oxygen - O2	TCD3 C,	1.54	56	0.0502
Nitrogen - N2	TCD3 C,	1.75	949	0.8008
Methane - C1	TCD3 C,	2.32	80366	92.4171
Propane - C3	FID1 A,	3.40	10114	0.1180
Iso Butane - iC4	FID1 A,	3.84	6220	0.0513
Normal Butane -nC4	FID1 A,	4.12	3799	0.0314
Iso Pentane - iC5	FID1 A,	4.96	7778	0.0500
Normal Pentane - nC5	FID1 A,	5.29	7880	0.0499
Carbon Dioxide - CO2	TCD2 B,	7.39	150	0.1479
Ethane - C2	TCD2 B,	8.17	5106	6.3863
		Total	122419	100.1028

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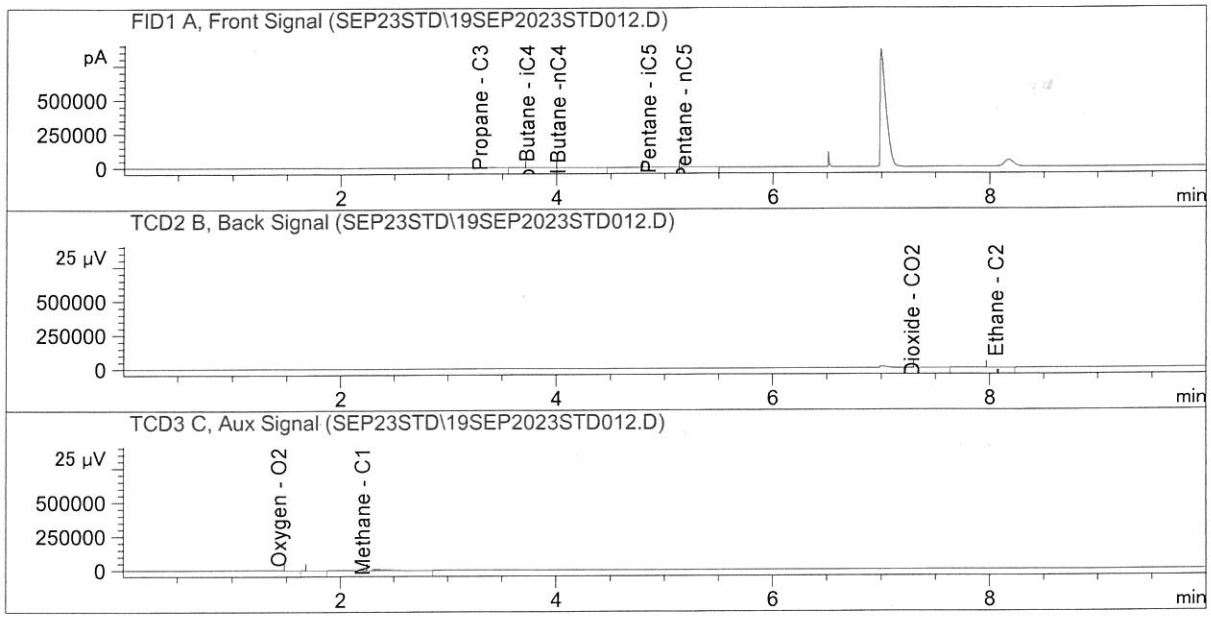
Method: C:\CHEM32\1\METHODS\SEP23_AGILENT6.M
File Name: C:\CHEM32\1\DATA\SEP23STD\19SEP2023STD012.D

Instrument: Agilent 6
Injection Date: Tue, 19. Sep. 2023 9:06:24 AM
Lab. Tech.: ABBAS

Sample Name: STANDARD
Sample Note: 760 mmHg



Name	Signal	RT(min)	Area	Amount
Oxygen - O2	TCD3 C,	1.54	56	0.0500
Nitrogen - N2	TCD3 C,	1.75	948	0.7992
Methane - C1	TCD3 C,	2.32	80215	92.2429
Propane - C3	FID1 A,	3.40	10111	0.1180
Iso Butane - iC4	FID1 A,	3.84	6221	0.0513
Normal Butane -nC4	FID1 A,	4.12	3799	0.0314
Iso Pentane - iC5	FID1 A,	4.96	7783	0.0500
Normal Pentane - nC5	FID1 A,	5.29	7883	0.0499
Carbon Dioxide - CO2	TCD2 B,	7.39	150	0.1481
Ethane - C2	TCD2 B,	8.17	5080	6.3537
		Total	122245	99.8945

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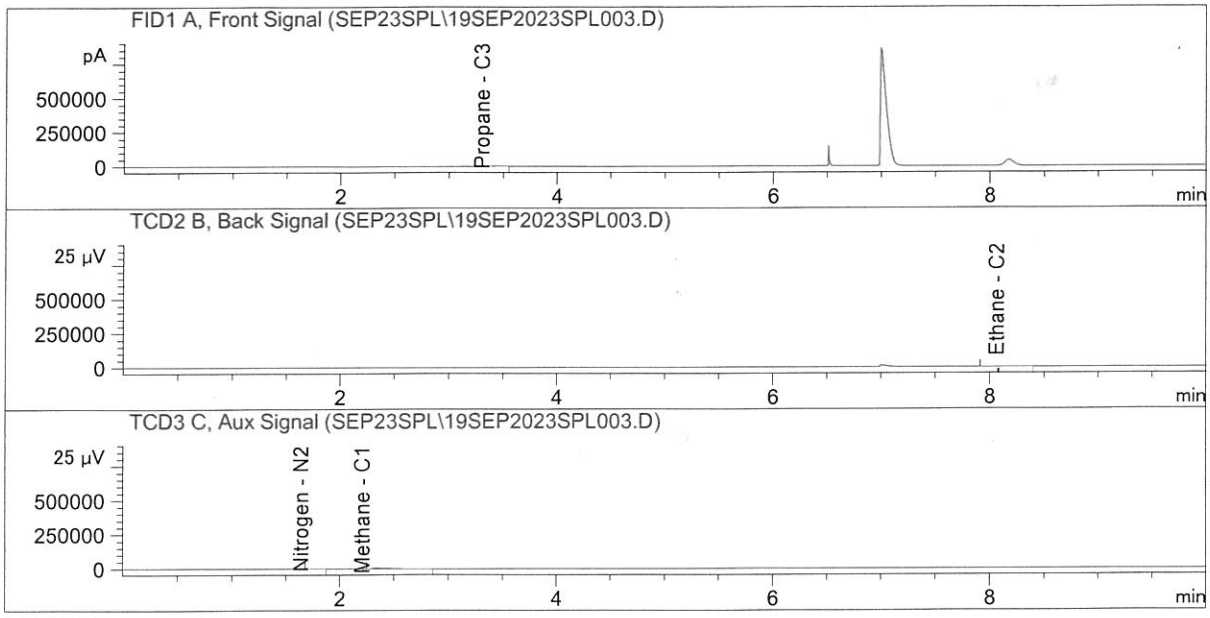
Method: C:\CHEM32\1\METHODS\SEP23_AGILENT6.M
File Name: C:\CHEM32\1\DATA\SEP23SPL\19SEP2023SPL003.D

Instrument: Agilent 6
Injection Date: Tue, 19. Sep. 2023 10:06:23 AM
Lab. Tech.: ABBAS

Sample Name: QG CPC CORRELATION
Sample Note: 760 mmHg



Name	Signal	RT(min)	Area	Amount
Oxygen - O2	TCD3 C,	1.54	0	0.0000
Nitrogen - N2	TCD3 C,	1.75	713	0.6015
Methane - C1	TCD3 C,	2.32	80366	92.4170
Propane - C3	FID1 A,	3.40	7370	0.0860
Iso Butane - iC4	FID1 A,	3.84	0	0.0000
Normal Butane -nC4	FID1 A,	4.12	0	0.0000
Iso Pentane - iC5	FID1 A,	4.96	0	0.0000
Normal Pentane - nC5	FID1 A,	5.29	0	0.0000
Carbon Dioxide - CO2	TCD2 B,	7.39	0	0.0000
Ethane - C2	TCD2 B,	8.17	4980	6.2284
		Total	93428	99.3329

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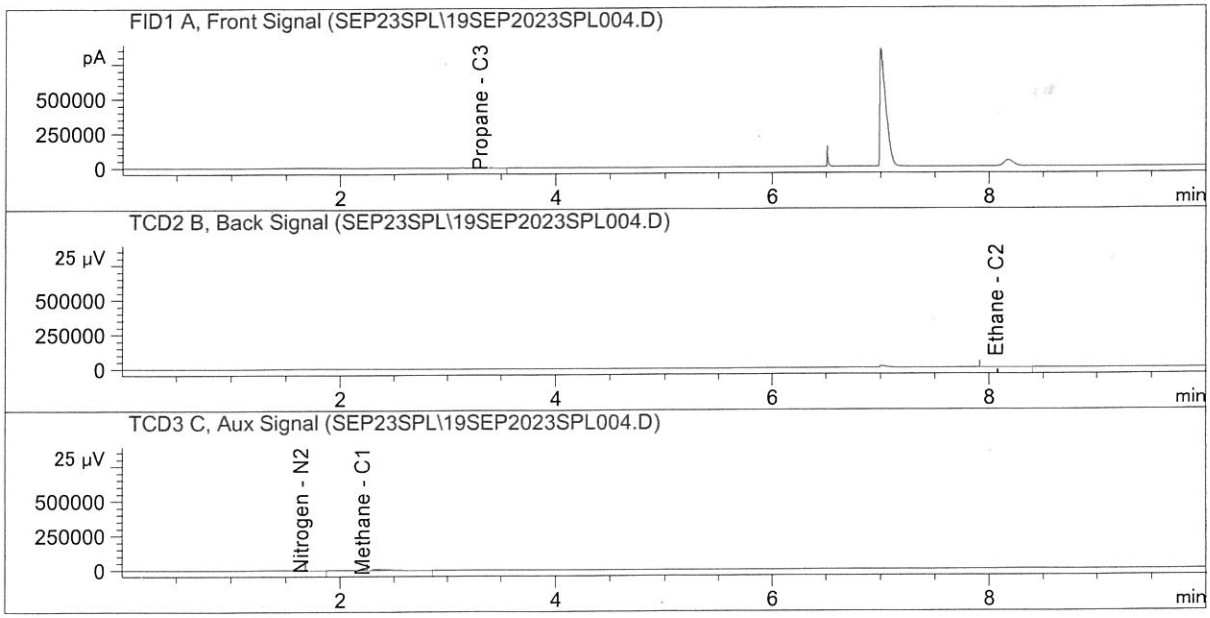
Method: C:\CHEM32\1\METHODS\SEP23_AGILENT6.M
File Name: C:\CHEM32\1\DATA\SEP23SPL\19SEP2023SPL004.D

Instrument: Agilent 6
Injection Date: Tue, 19. Sep. 2023 10:19:22 AM
Lab. Tech.: ABBAS

Sample Name: QG CPC CORRELATION
Sample Note: 760 mmHg



Name	Signal	RT(min)	Area	Amount
Oxygen - O2	TCD3 C,	1.54	0	0.0000
Nitrogen - N2	TCD3 C,	1.75	712	0.6003
Methane - C1	TCD3 C,	2.32	80267	92.3033
Propane - C3	FID1 A,	3.40	7364	0.0859
Iso Butane - iC4	FID1 A,	3.84	0	0.0000
Normal Butane -nC4	FID1 A,	4.12	0	0.0000
Iso Pentane - iC5	FID1 A,	4.96	0	0.0000
Normal Pentane - nC5	FID1 A,	5.29	0	0.0000
Carbon Dioxide - CO2	TCD2 B,	7.39	0	0.0000
Ethane - C2	TCD2 B,	8.17	4973	6.2207
		Total	93316	99.2102

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CORRELATION SHEET FOR LNG CERTIFICATION

SAMPLE	REFERENCE STANDARD GAS	CORRELATION TEST SAMPLE
CYLINDER No.	5710175	DL 6110
SQC SAMPLE TYPE	NOT APPLICABLE	QG - CPC CORRELATION SAMPLE
LOCATION	QATARGAS SOUTH LAB. / AGILENT - SYSTEM-7	QATARGAS SOUTH LAB./ AGILENT - SYSTEM-7
GC MODEL	AGILENT 7890B	AGILENT 7890B
GC SERIAL No.	US 13493020	US 13493020
DATE CERTIFIED	12-May-22	19-Sep-23
SAMPLED BY	SCOTT SPECIALTY GASES	AGIN RASLAN
ANALYSIS DATE	19-Sep-23	19-Sep-23
ANALYST	MOHAMMED ABBAS	MOHAMMED ABBAS
ANALYSIS METHOD	GC, GPA 2261	GC, GPA 2261

COMPONENT	CERTIFICATE	COUNT 1			COUNT 2			DIFF	AVERAGE	COUNT 1			COUNT 2			DIFF	TEST RESULT (MOL%)	
	MOL%	SAMPLE PRESSURE	PEAK AREA	RESPONSE FACTOR	SAMPLE PRESSURE	PEAK AREA	RESPONSE FACTOR	RESPONSE FACTOR	RESPONSE FACTOR	SAMPLE PRESSURE	PEAK AREA	MOL%	SAMPLE PRESSURE	PEAK AREA	MOL%	MOL%	UNORMALIZED	REPORTED VALUE
	A	B(mmHg)	C	D=A*B/C	E(mmHg)	F	G=A*E/F	H=(D-G)*100/I	I=(D+G)/2	J	K	L=I*K/J	M	N	O=I*N/M	P=(L-O)*100/Q	Q=(L+O)/2	
O2	0.0501	760	49	0.7770612	760	49	0.7770612	0.00	0.777061224	760	0	**0.0000000**	760	0	**0.0000000**	-	**0.000**	0.000
N2	0.8000	760	832	0.7307692	760	833	0.7298920	0.12	0.730330594	760	636	**0.6111714**	760	636	**0.6111714**	0.00	**0.611**	0.610
CH4	92.3300	760	70057	1.0016244	760	70146	1.0003535	0.13	1.000988970	760	70933	**93.4251982**	760	70958	**93.4581254**	0.04	**93.442**	93.030
C3H8	0.1180	760	11416	0.0078556	760	11409	0.0078605	0.06	0.007858051	760	8443	**0.0872967**	760	8447	**0.0873381**	0.05	**0.087**	0.090
I-C4H10	0.0513	760	6595	0.0059118	760	6600	0.0059073	0.08	0.005909512	760	0	**0.0000000**	760	0	**0.0000000**	-	**0.000**	0.000
N-C4H10	0.0314	760	4025	0.0059233	760	4022	0.0059277	0.07	0.005925489	760	0	**0.0000000**	760	0	**0.0000000**	-	**0.000**	0.000
I-C5H12	0.0500	760	8187	0.0046415	760	8193	0.0046381	0.07	0.004639805	760	0	**0.0000000**	760	0	**0.0000000**	-	**0.000**	0.000
N-C5H12	0.0499	760	8227	0.0046097	760	8232	0.0046069	0.06	0.004608300	760	0	**0.0000000**	760	0	**0.0000000**	-	**0.000**	0.000
CO2	0.1480	760	136	0.8270588	760	135	0.8331852	0.74	0.830122004	760	0	**0.0000000**	760	0	**0.0000000**	-	**0.000**	0.000
C2H6	6.3700	760	7928	0.6106458	760	7948	0.6091092	0.25	0.609877511	760	7851	**6.3001952**	760	7852	**6.3009977**	0.01	**6.301**	6.270
C6H14+	0.0000	760	0	0.0000000	760	0	0.0000000	0.00	0.000000000	760	0	**0.0000000**	760	0	**0.0000000**	-	**0.000**	0.000
TOTAL	99.9987		**117452**			**117567**					**87863**	**100.4238615**		**87893**	**100.4576326**		**100.441**	100.000

QG

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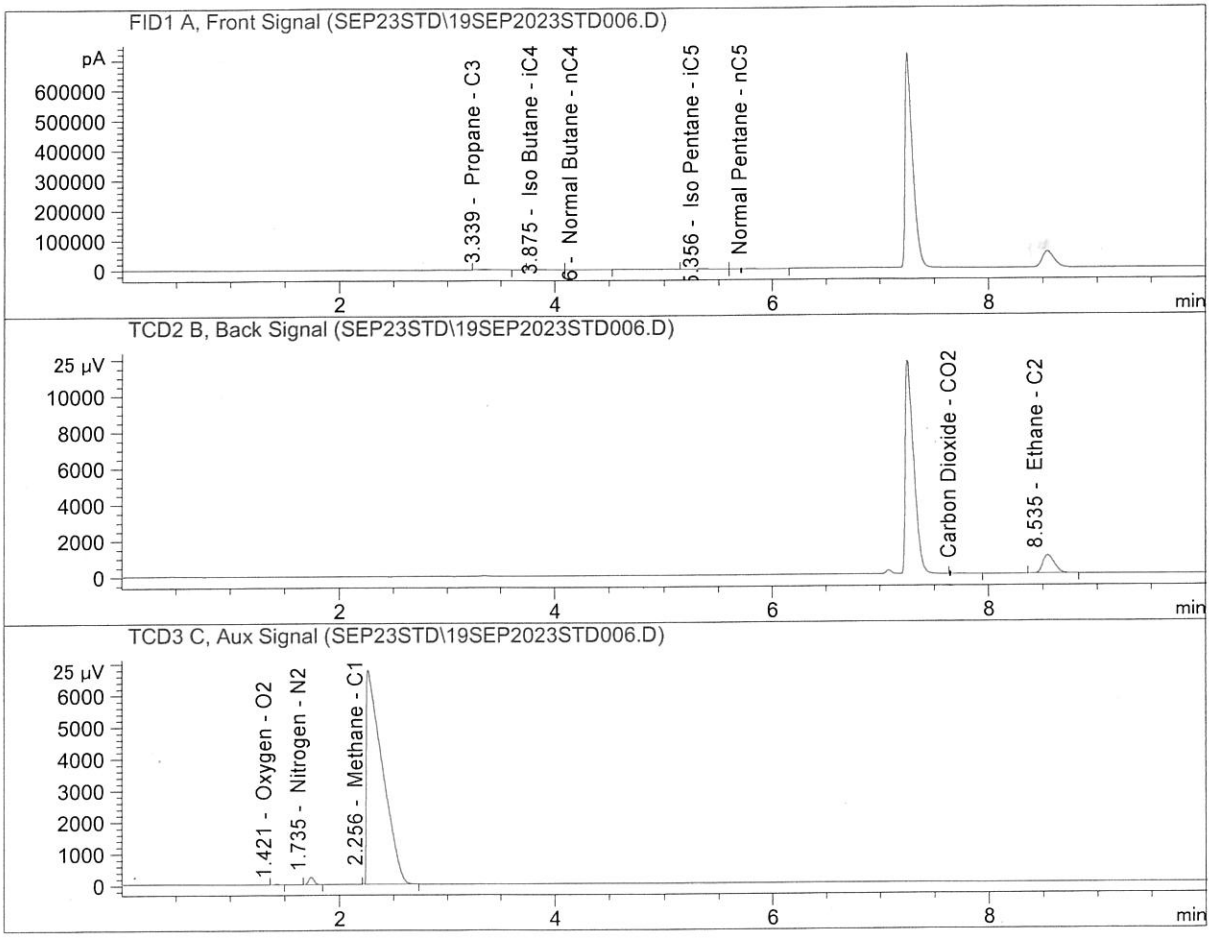
Method: C:\CHEM32\1\METHODS\SEP23_AGILENT7.M
File Name: C:\CHEM32\1\DATA\SEP23STD\19SEP2023STD006.D

Instrument: Agilent 7
Injection Date: Tue, 19. Sep. 2023 11:26:24 AM
Lab. Tech.: ABBAS

Sample Name: STANDARD
Sample Note: 760 mmHg



Name	Signal	RT(min)	Area	Amount
Oxygen - O2	TCD3 C,	1.42	49	0.0501
Nitrogen - N2	TCD3 C,	1.73	832	0.7994
Methane - C1	TCD3 C,	2.25	70057	92.2713
Propane - C3	FID1 A,	3.33	11416	0.1180
Iso Butane - iC4	FID1 A,	3.87	6595	0.0513
Normal Butane - nC4	FID1 A,	4.24	4025	0.0314
Iso Pentane - iC5	FID1 A,	5.34	8187	0.0500
Normal Pentane - nC5	FID1 A,	5.79	8227	0.0499
Carbon Dioxide - CO2	TCD2 B,	7.74	136	0.1485
Ethane - C2	TCD2 B,	8.53	7928	6.3621
		Total	117452	99.9320

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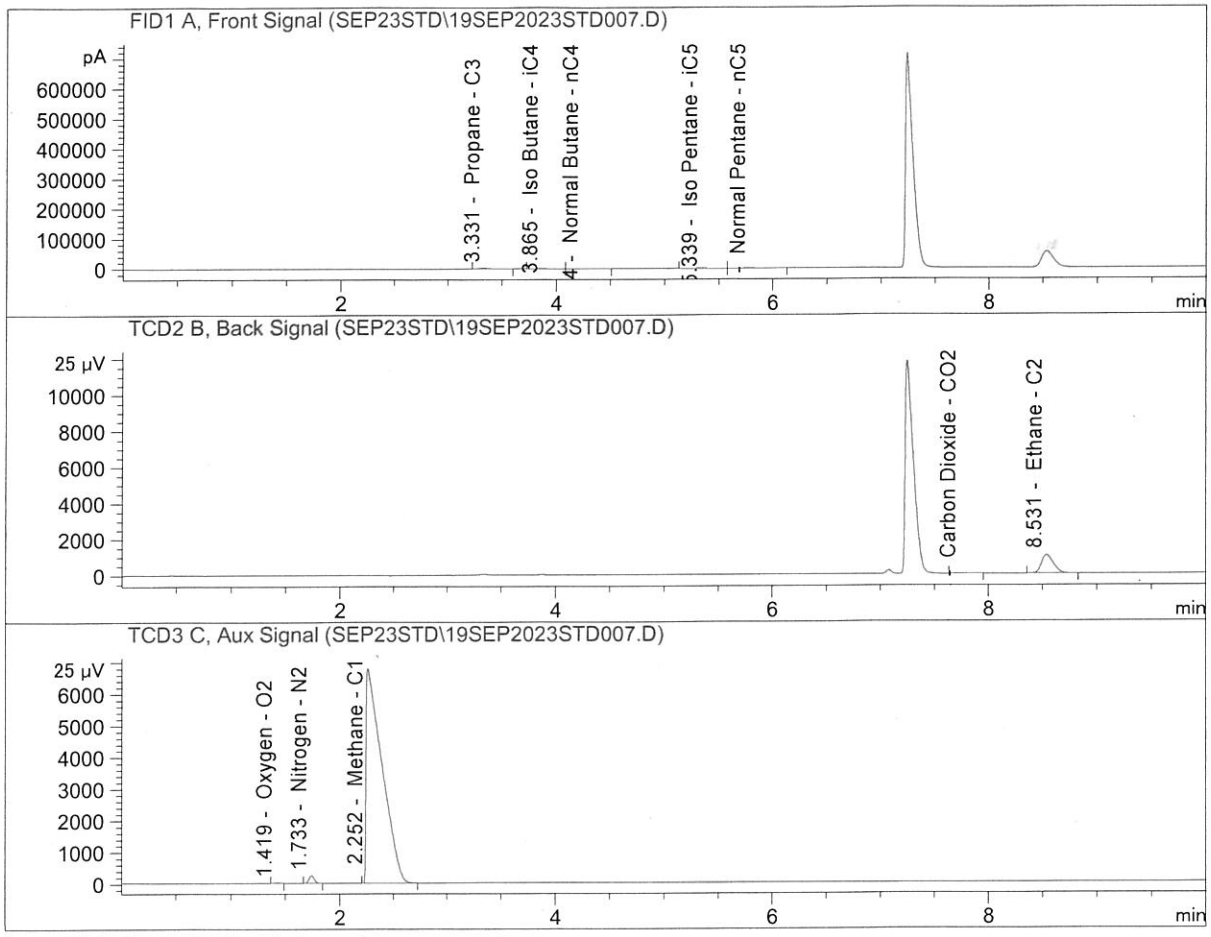
QATARGAS - SOUTH LABORATORY

Method: C:\CHEM32\1\METHODS\SEP23_AGILENT7.M
File Name: C:\CHEM32\1\DATA\SEP23STD\19SEP2023STD007.D

Instrument: Agilent 7
Injection Date: Tue, 19. Sep. 2023 11:36:46 AM
Lab. Tech.: ABBAS

Sample Name: STANDARD
Sample Note: 760 mmHg



Name	Signal	RT(min)	Area	Amount
Oxygen - O2	TCD3 C,	1.42	49	0.0501
Nitrogen - N2	TCD3 C,	1.73	833	0.8006
Methane - C1	TCD3 C,	2.25	70146	92.3887
Propane - C3	FID1 A,	3.33	11409	0.1180
Iso Butane - iC4	FID1 A,	3.87	6600	0.0513
Normal Butane - nC4	FID1 A,	4.24	4022	0.0314
Iso Pentane - iC5	FID1 A,	5.34	8193	0.0500
Normal Pentane - nC5	FID1 A,	5.79	8232	0.0499
Carbon Dioxide - CO2	TCD2 B,	7.74	135	0.1475
Ethane - C2	TCD2 B,	8.53	7948	6.3779
		Total	117566	100.0653

QG

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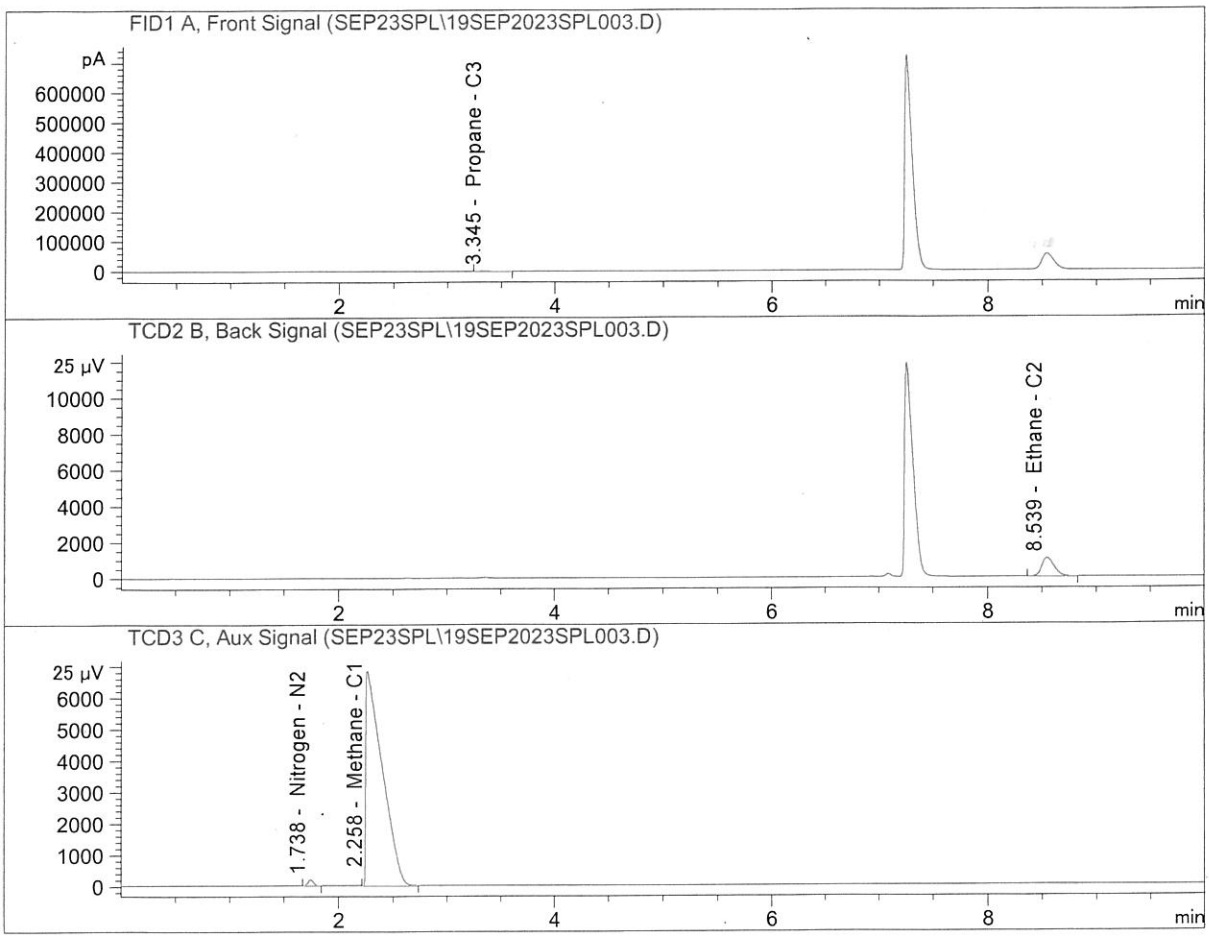
QATARGAS - SOUTH LABORATORY

Method: C:\CHEM32\1\METHODS\SEP23_AGILENT7.M
File Name: C:\CHEM32\1\DATA\SEP23SPL\19SEP2023SPL003.D

Instrument: Agilent 7
Injection Date: Tue, 19. Sep. 2023 10:15:09 AM
Lab. Tech.: ABBAS

Sample Name: QG CPC CORRELATION
Sample Note: 760 mmHg



Name	Signal	RT(min)	Area	Amount
Oxygen - O2	TCD3 C,	1.42	0	0.0000
Nitrogen - N2	TCD3 C,	1.73	636	0.6110
Methane - C1	TCD3 C,	2.25	70933	93.4249
Propane - C3	FID1 A,	3.33	8443	0.0873
Iso Butane - iC4	FID1 A,	3.87	0	0.0000
Normal Butane - nC4	FID1 A,	4.24	0	0.0000
Iso Pentane - iC5	FID1 A,	5.34	0	0.0000
Normal Pentane - nC5	FID1 A,	5.79	0	0.0000
Carbon Dioxide - CO2	TCD2 B,	7.74	0	0.0000
Ethane - C2	TCD2 B,	8.53	7851	6.3002
		Total	87863	100.4234

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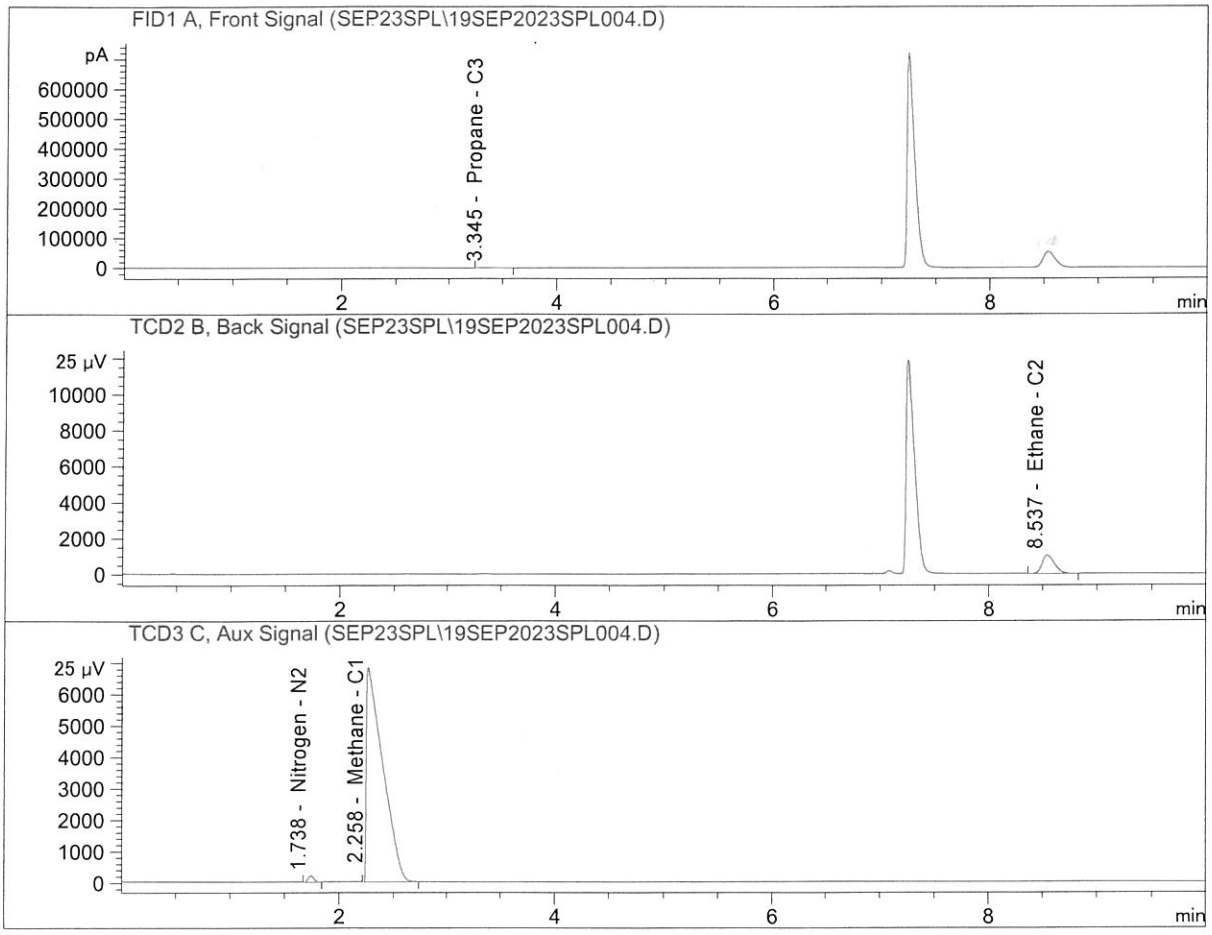
QATARGAS - SOUTH LABORATORY

Method: C:\CHEM32\1\METHODS\SEP23_AGILENT7.M
File Name: C:\CHEM32\1\DATA\SEP23SPL\19SEP2023SPL004.D

Instrument: Agilent 7
Injection Date: Tue, 19. Sep. 2023 10:27:46 AM
Lab. Tech.: ABBAS

Sample Name: QG CPC CORRELATION
Sample Note: 760 mmHg



Name	Signal	RT(min)	Area	Amount
Oxygen - O2	TCD3 C,	1.42	0	0.0000
Nitrogen - N2	TCD3 C,	1.73	636	0.6113
Methane - C1	TCD3 C,	2.25	70958	93.4578
Propane - C3	FID1 A,	3.33	8447	0.0873
Iso Butane - iC4	FID1 A,	3.87	0	0.0000
Normal Butane - nC4	FID1 A,	4.24	0	0.0000
Iso Pentane - iC5	FID1 A,	5.34	0	0.0000
Normal Pentane - nC5	FID1 A,	5.79	0	0.0000
Carbon Dioxide - CO2	TCD2 B,	7.74	0	0.0000
Ethane - C2	TCD2 B,	8.53	7852	6.3006
		Total	87892	100.4570

QG

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CORRELATION SHEET FOR LNG CERTIFICATION

SAMPLE	REFERENCE STANDARD GAS	CORRELATION TEST SAMPLE
CYLINDER No.	5710175	DL 6110
SQC SAMPLE TYPE	NOT APPLICABLE	QG - CPC CORRELATION SAMPLE
LOCATION	QATARGAS SOUTH LAB. / AGILENT - SYSTEM-8	QATARGAS SOUTH LAB./ AGILENT - SYSTEM-8
GC MODEL	AGILENT 7890B	AGILENT 7890B
GC SERIAL No.	US 13503014	US 13503014
DATE CERTIFIED	12-May-22	19-Sep-23
SAMPLED BY	SCOTT SPECIALTY GASES	AGIN RASLAN
ANALYSIS DATE	19-Sep-23	19-Sep-23
ANALYST	MOHAMMED ABBAS	MOHAMMED ABBAS
ANALYSIS METHOD	GC, GPA 2261	GC, GPA 2261

COMPONENT	CERTIFICATE MOL%	COUNT 1			COUNT 2			DIFF RESPONSE FACTOR	AVERAGE RESPONSE FACTOR	COUNT 1			COUNT 2			DIFF MOL%	TEST RESULT (MOL%)	
		SAMPLE PRESSURE	PEAK AREA	RESPONSE FACTOR	SAMPLE PRESSURE	PEAK AREA	RESPONSE FACTOR			SAMPLE PRESSURE	PEAK AREA	MOL%	SAMPLE PRESSURE	PEAK AREA	MOL%		UNORMALIZED	REPORTED VALUE
	A	B(mmHg)	C	D=A*B/C	E(mmHg)	F	G=A*E/F	H=(D-G)*100/I	I=(D+G)/2	J	K	L=I*K/J	M	N	O=I*N/M	P=(L-O)*100/Q	Q=(L+O)/2	
O2	0.0501	760	52	0.7322308	760	52	0.7322308	0.00	0.732230769	760	0	**0.0000000**	760	0	**0.0000000**	-	**0.000**	0.000
N2	0.8000	760	838	0.7255370	760	837	0.7264038	0.12	0.725970408	760	638	**0.6094331**	760	638	**0.6094331**	0.00	**0.609**	0.610
CH4	92.3300	760	69599	1.0082156	760	69592	1.0083170	0.01	1.008266342	760	70048	**92.9303167**	760	70007	**92.8759234**	0.06	**92.903**	93.010
C3H8	0.1180	760	10642	0.0084270	760	10630	0.0084365	0.11	0.008431744	760	7884	**0.0874682**	760	7880	**0.0874239**	0.05	**0.087**	0.090
I-C4H10	0.0513	760	6078	0.0064146	760	6071	0.0064220	0.12	0.006418308	760	0	**0.0000000**	760	0	**0.0000000**	-	**0.000**	0.000
N-C4H10	0.0314	760	3695	0.0064523	760	3692	0.0064575	0.08	0.006454908	760	0	**0.0000000**	760	0	**0.0000000**	-	**0.000**	0.000
I-C5H12	0.0500	760	7418	0.0051227	760	7413	0.0051261	0.07	0.005124402	760	0	**0.0000000**	760	0	**0.0000000**	-	**0.000**	0.000
N-C5H12	0.0499	760	7424	0.0051083	760	7423	0.0051090	0.01	0.005108641	760	0	**0.0000000**	760	0	**0.0000000**	-	**0.000**	0.000
CO2	0.1480	760	164	0.6858537	760	163	0.6900613	0.61	0.687957504	760	0	**0.0000000**	760	0	**0.0000000**	-	**0.000**	0.000
C2H6	6.3700	760	8431	0.5742142	760	8427	0.5744868	0.05	0.574350489	760	8322	**6.2891379**	760	8315	**6.2838478**	0.08	**6.286**	6.290
C6H14*	0.0000	760	0	0.0000000	760	0	0.0000000	0.00	0.000000000	760	0	**0.0000000**	760	0	**0.0000000**	-	**0.000**	0.000
TOTAL	99.9987		**114341**			**114300**					**86892**	**99.9163559**		**86840**	**99.8566281**		**99.885**	100.000

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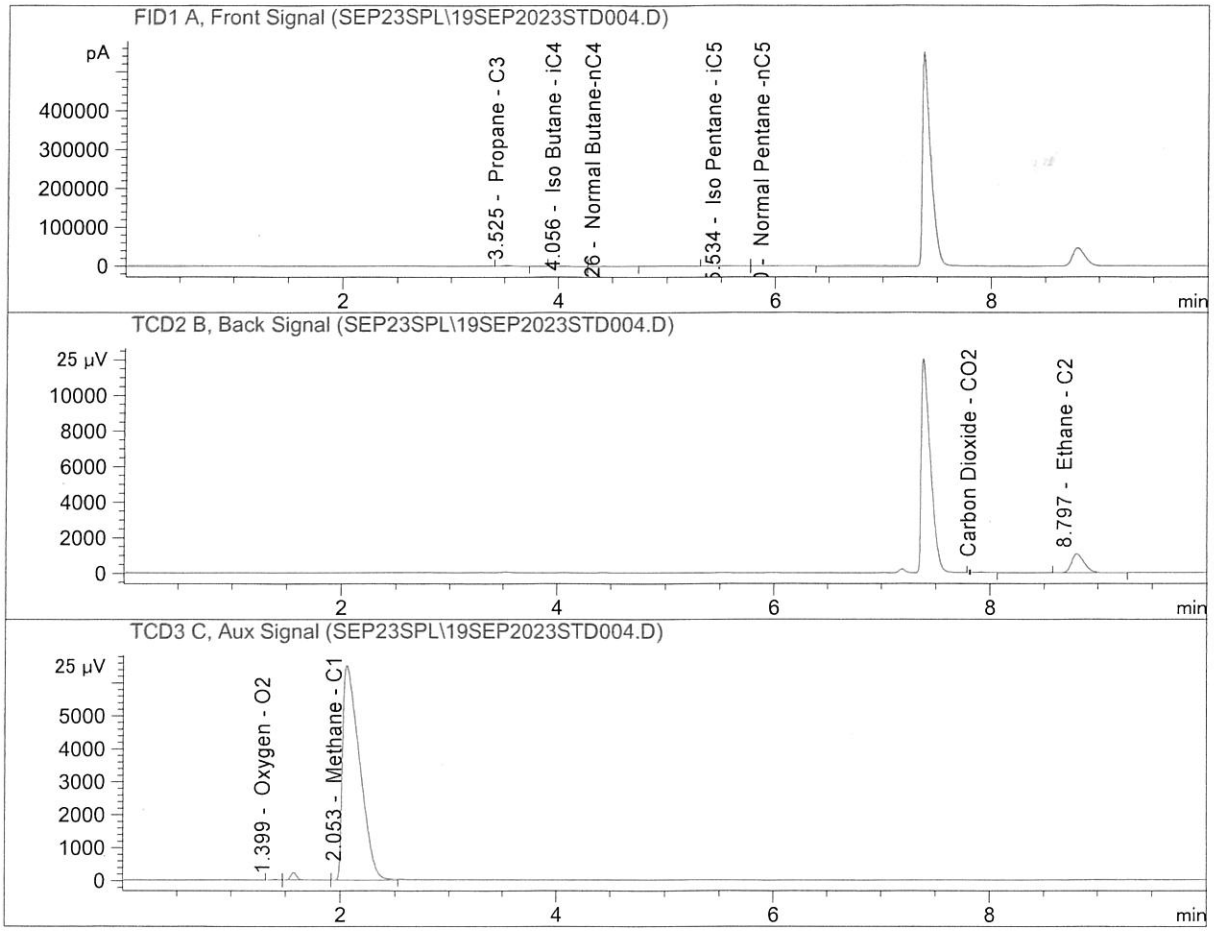
Method: C:\CHEM32\1\METHODS\SEP23_AGILENT8.M
File Name: C:\CHEM32\1\DATA\SEP23SPL\19SEP2023STD004.D

Instrument: Agilent 8
Injection Date: Tue, 19. Sep. 2023 7:04:12 AM
Lab. Tech.: ABBAS

Sample Name: STANDARD
Sample Note: 760 mmHg



Name	Signal	RT(min)	Area	Amount
Oxygen - O2	TCD3 C,	1.40	52	0.0500
Nitrogen - N2	TCD3 C,	1.57	838	0.7990
Methane - C1	TCD3 C,	2.05	69599	92.2764
Propane - C3	FID1 A,	3.51	10642	0.1183
Iso Butane - iC4	FID1 A,	4.05	6078	0.0515
Normal Butane-nC4	FID1 A,	4.41	3695	0.0315
Iso Pentane - iC5	FID1 A,	5.52	7418	0.0502
Normal Pentane -nC5	FID1 A,	5.97	7424	0.0501
Carbon Dioxide - CO2	TCD2 B,	7.90	164	0.1467
Ethane - C2	TCD2 B,	8.78	8431	6.3888
		Total	114340	99.9624

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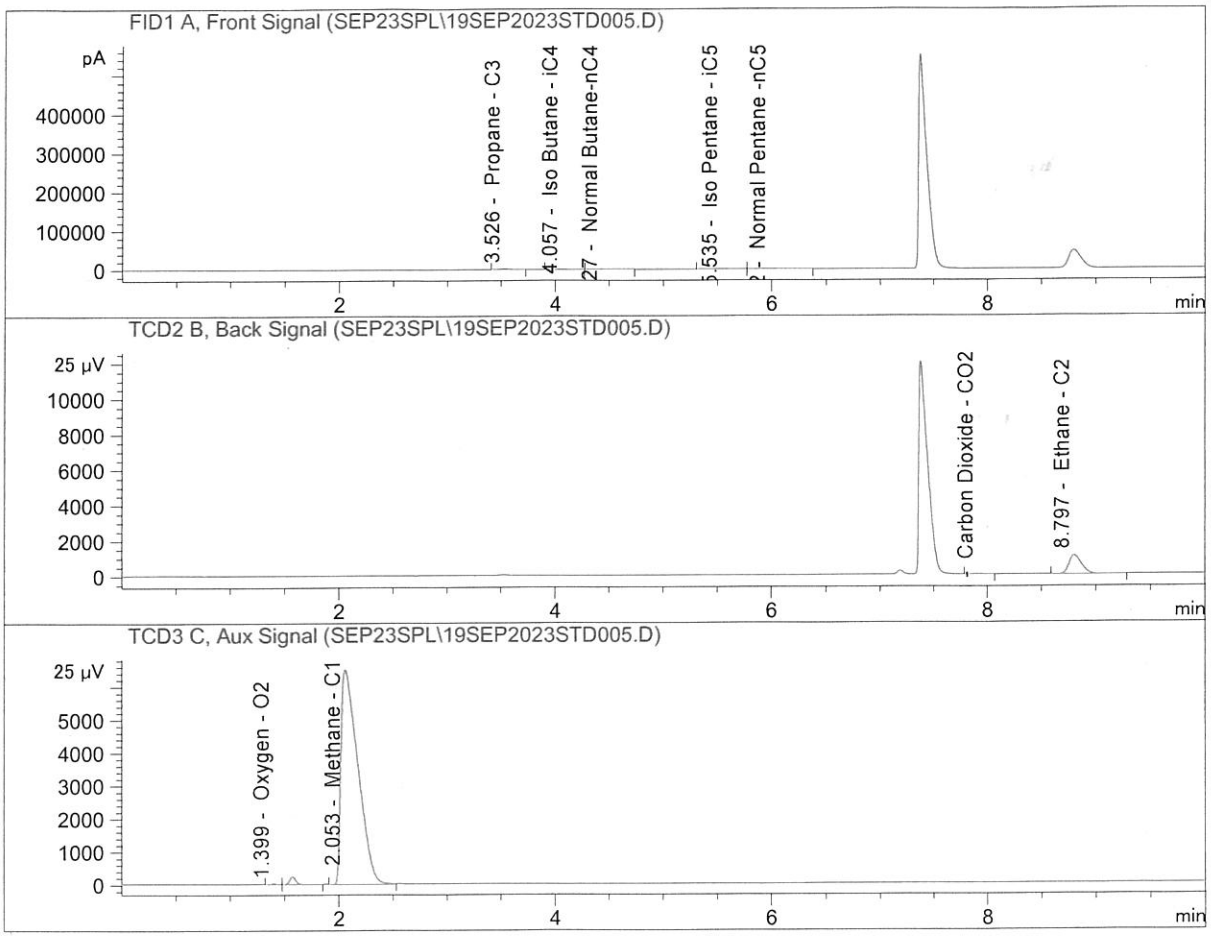
Method: C:\CHEM32\1\METHODS\SEP23_AGILENT8.M
File Name: C:\CHEM32\1\DATA\SEP23SPL\19SEP2023STD005.D

Instrument: Agilent 8
Injection Date: Tue, 19. Sep. 2023 7:15:43 AM
Lab. Tech.: ABBAS

Sample Name: STANDARD
Sample Note: 760 mmHg



Name	Signal	RT(min)	Area	Amount
Oxygen - O2	TCD3 C,	1.40	52	0.0499
Nitrogen - N2	TCD3 C,	1.57	837	0.7986
Methane - C1	TCD3 C,	2.05	69592	92.2675
Propane - C3	FID1 A,	3.51	10630	0.1181
Iso Butane - iC4	FID1 A,	4.05	6071	0.0514
Normal Butane-nC4	FID1 A,	4.41	3692	0.0314
Iso Pentane - iC5	FID1 A,	5.52	7413	0.0501
Normal Pentane -nC5	FID1 A,	5.97	7423	0.0501
Carbon Dioxide - CO2	TCD2 B,	7.90	163	0.1465
Ethane - C2	TCD2 B,	8.78	8427	6.3863
		Total	114300	99.9499

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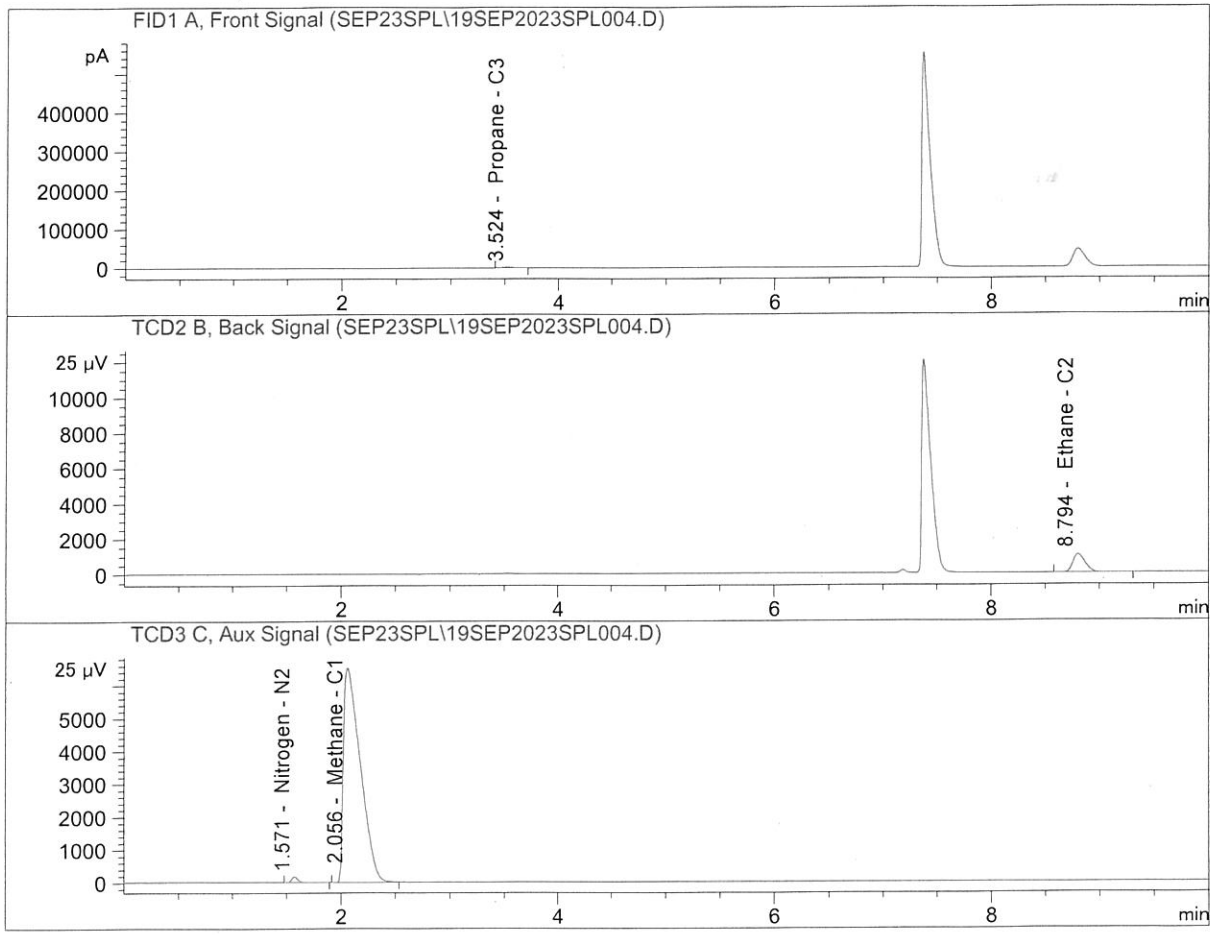
Method: C:\CHEM32\1\METHODS\SEP23_AGILENT8.M
File Name: C:\CHEM32\1\DATA\SEP23SPL\19SEP2023SPL004.D

Instrument: Agilent 8
Injection Date: Tue, 19. Sep. 2023 10:23:10 AM
Lab. Tech.: ABBAS

Sample Name: QG CPC CORRELATION
Sample Note: 760 mmHg



Name	Signal	RT(min)	Area	Amount
Oxygen - O2	TCD3 C,	1.40	0	0.0000
Nitrogen - N2	TCD3 C,	1.57	638	0.6087
Methane - C1	TCD3 C,	2.05	70048	92.8725
Propane - C3	FID1 A,	3.51	7884	0.0876
Iso Butane - iC4	FID1 A,	4.05	0	0.0000
Normal Butane-nC4	FID1 A,	4.41	0	0.0000
Iso Pentane - iC5	FID1 A,	5.52	0	0.0000
Normal Pentane -nC5	FID1 A,	5.97	0	0.0000
Carbon Dioxide - CO2	TCD2 B,	7.90	0	0.0000
Ethane - C2	TCD2 B,	8.78	8322	6.3064
		Total	86892	99.8752

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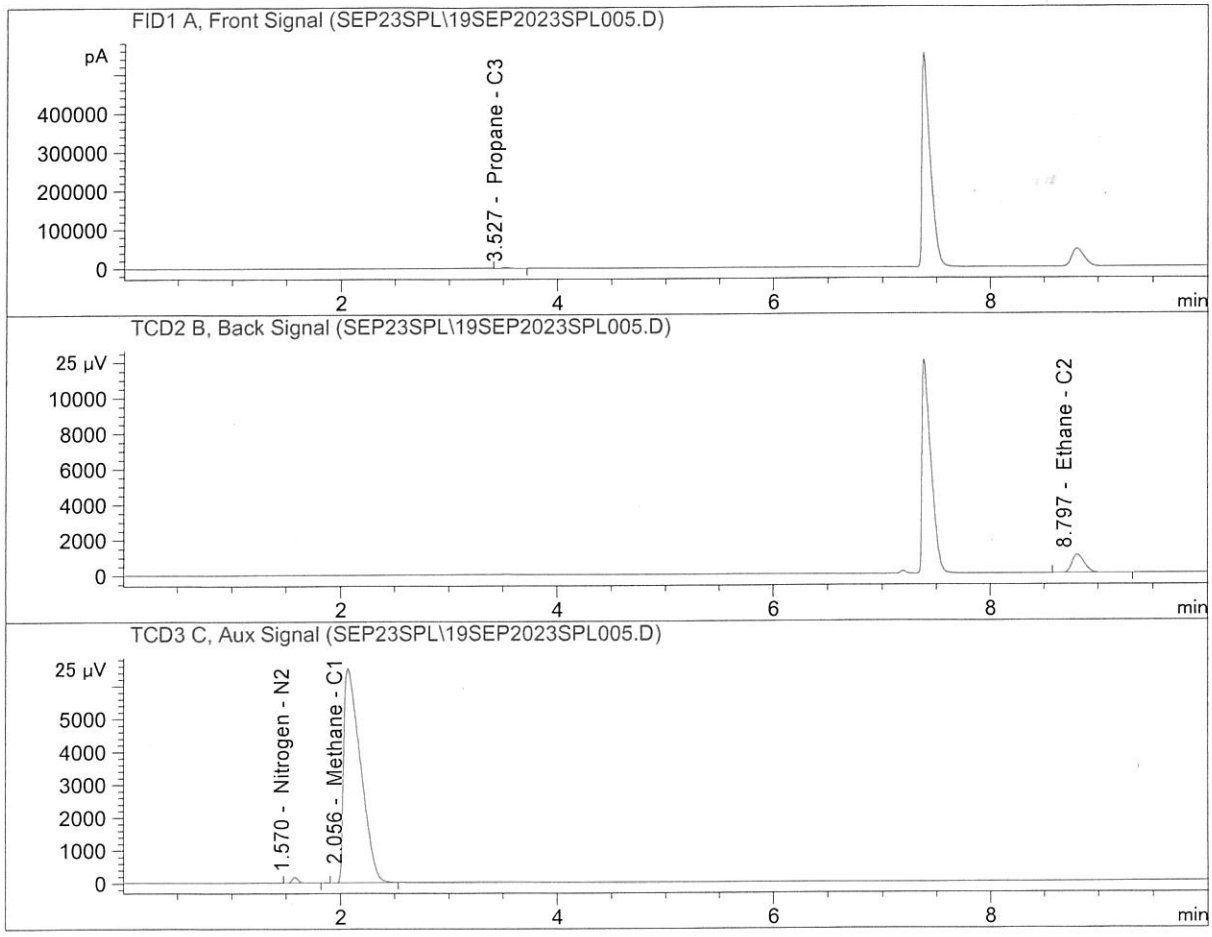
Method: C:\CHEM32\1\METHODS\SEP23_AGILENT8.M
File Name: C:\CHEM32\1\DATA\SEP23SPL\19SEP2023SPL005.D

Instrument: Agilent 8
Injection Date: Tue, 19. Sep. 2023 10:37:10 AM
Lab. Tech.: ABBAS

Sample Name: QG CPC CORRELATION
Sample Note: 760 mmHg



Name	Signal	RT(min)	Area	Amount
Oxygen - O2	TCD3 C,	1.40	0	0.0000
Nitrogen - N2	TCD3 C,	1.57	638	0.6083
Methane - C1	TCD3 C,	2.05	70007	92.8176
Propane - C3	FID1 A,	3.51	7880	0.0876
Iso Butane - iC4	FID1 A,	4.05	0	0.0000
Normal Butane-nC4	FID1 A,	4.41	0	0.0000
Iso Pentane - iC5	FID1 A,	5.52	0	0.0000
Normal Pentane -nC5	FID1 A,	5.97	0	0.0000
Carbon Dioxide - CO2	TCD2 B,	7.90	0	0.0000
Ethane - C2	TCD2 B,	8.78	8315	6.3011
		Total	86840	99.8146

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specialty gases

CALIBRATION
RvA K 064

ISO/IEC 17025 - Calibration Certificate
Calibrated gas mixture

Certificate Number: 20-31690-010-5710175 Rev-00

Customer:
Name: QATARGAS OPERATING COMPANY LTD.
ATTN: (FOR QATAR LIQ.GAS.CO.LTD
Adress: X32 SOUTH MAIN WARFHOUSE
RAS LAFFAN IND. CITY
STATE OF QATAR

Product: Calibrated gas mixture intended as calibration standard.

Cylinder number: 5710175
Cylinder pressure: 15 MPa
Cylinder size: 10 Liter
Valve connection: CGA-350

Calibration method: The composition is determined in accordance with ISO 6143.

Traceability: The measurements have been executed using standards for which the traceability to (inter)national standards has been demonstrated towards the RvA.

Calibration result:

Component	Mole fraction mol/mol	Expanded uncertainty (k=2) mol/mol	Calibration date
Methane	92,33 x 10^{-2}	0,09 x 10^{-2}	12 May 2022
Ethane	6,37 x 10^{-2}	0,07 x 10^{-2}	12 May 2022
Propane	0,1180 x 10^{-2}	0,0024 x 10^{-2}	12 May 2022
Isobutane	513 x 10^{-6}	5 x 10^{-6}	12 May 2022
Butane	313,7 x 10^{-6}	3,1 x 10^{-6}	12 May 2022
Isopentane	500 x 10^{-6}	5 x 10^{-6}	12 May 2022
Pentane	499 x 10^{-6}	5 x 10^{-6}	12 May 2022
Carbon Dioxide	0,1480 x 10^{-2}	0,0044 x 10^{-2}	12 May 2022
Nitrogen *	0,800 x 10^{-2}	0,008 x 10^{-2}	10 May 2022
Oxygen *	0,0501 x 10^{-2}	0,0010 x 10^{-2}	10 May 2022

* Outside scope of accreditation.

Uncertainty: The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with Publication EA-4/02.

Product handling: Consult ISO 16664 for product handling guidelines.
Minimum utilisation pressure is 0,5 MPa.
Use and store the gas cylinder between -10°C and 40°C.

Stability: Scott Specialty Gases Netherlands B.V. stability studies of similar products have demonstrated stability for 36 months.

Scott Specialty Gases Netherlands B.V.
Calibration Laboratory
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4817 BL Breda, The Netherlands
ExpertiseCenter.North-West@airliquide.com
Chamber of Commerce Number: 20134663