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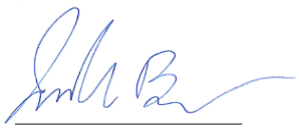
Title: **Frade Crude - Assay Report**

Client: **PetroRio**

Report No.: **120-22-12664**
Date of Issue: **September 16, 2022**

Sample ID: **Frade Crude**
Date Received: **August 30, 2022**
Date(s) Tested: **August 30 - September 15, 2022**
Sample Date: **August, 2022**
Sample Type: **Submitted by the Client**

Reported By:



Jeremiah Benner

Crude Assay Manager

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Table of Contents

Section		Page
1. Distillation Yield Data and Curves		
1.1 Distillation %mass Yield and %volume Yield Data	.....	3
1.2 Graph of Cumulative % yield against Temperature, °F AET	.....	4
2. Assay Summary	.....	5
3. Distillation Fractions' Characteristics and Gas Chromatography Reports		
3.1 Distillation Reports (D86 & D1160)	.....	6
3.2 Simulated Distillation on Whole Crude (D7169) Report	.....	7
3.3 Light Ends Analysis on Whole Crude (D7900) Report	.....	8
3.4 LPG (IBP-59°F) Composition by GC (D6730) Report	.....	9
3.5 Detailed Hydrocarbon Analysis on 59-149°F (D6730) Report	.....	10
3.6 Detailed Hydrocarbon Analysis on 149-212°F (D6730) Report	.....	11
3.7 Detailed Hydrocarbon Analysis on 212-302°F (D6730) Report	.....	12

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Distillation % Mass Yield and % Volume Yield

Cut Range °F	Mass Yield Wt. %	Cumulative Wt. %	Volume Yield Vol. %	Cumulative Vol. %
IBP - 59	0.52	0.52	0.90	0.90
59-149	0.91	1.43	1.28	2.18
149-212	1.11	2.54	1.40	3.58
212-302	2.81	5.35	3.37	6.95
302-392	3.95	9.30	4.48	11.43
392-482	6.26	15.56	6.81	18.24
482-572	9.05	24.61	9.53	27.77
572-662	8.82	33.43	9.03	36.80
662-698	3.61	37.04	3.62	40.42
698-842	12.85	49.89	12.63	53.05
842-932	11.54	61.43	11.19	64.24
932-1022	7.52	68.95	7.25	71.49
1022+	31.05	100.00	28.51	100.00

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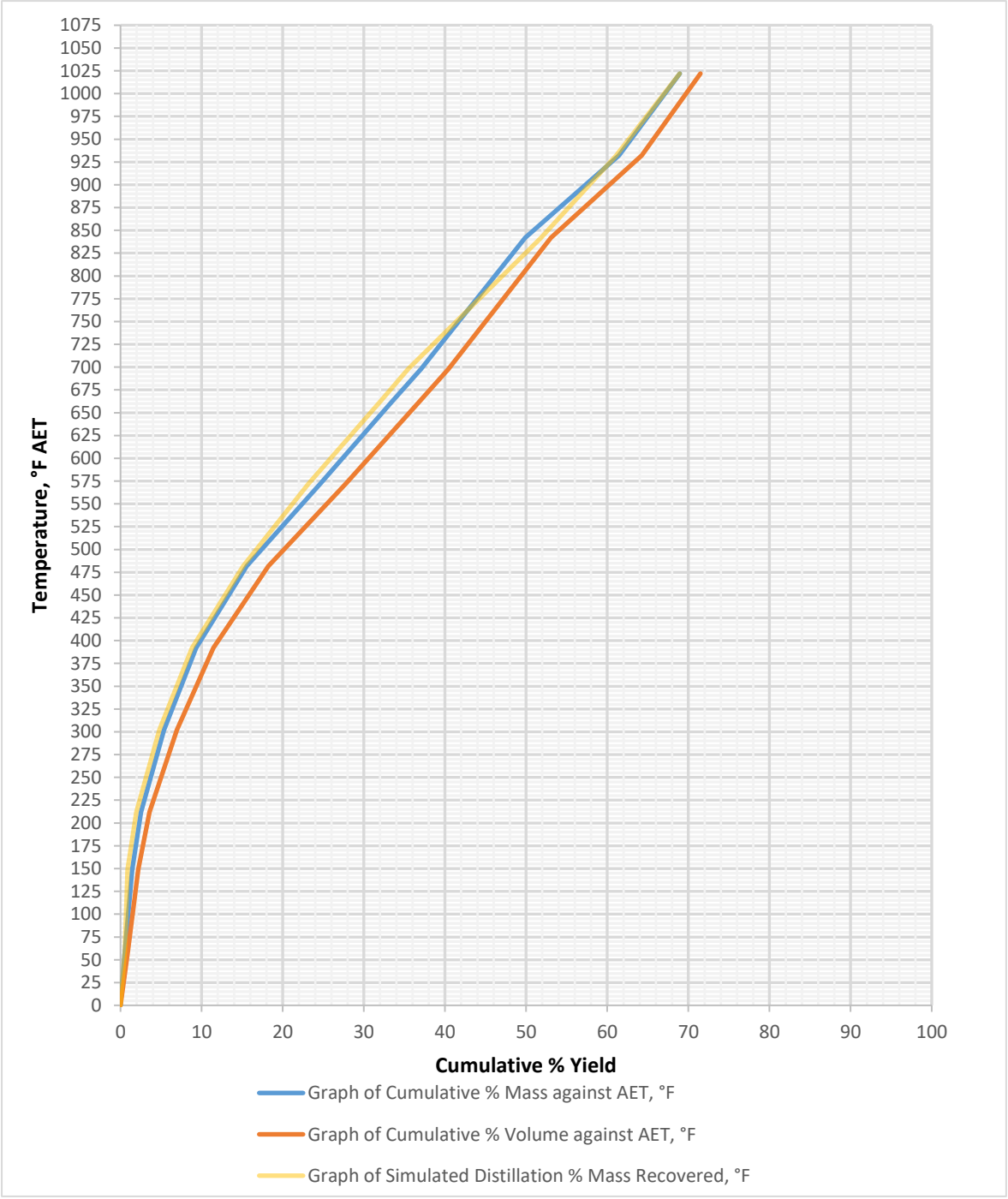
Graph of Cumulative % yield against Temperature, °F AET



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Assay Summary

Sample ID	Frade Crude		Whole Crude	Cut Range													
Lab ID	120-22-12664			IBP - 59°F	59-149°F	149-212°F	212-302°F	302-392°F	392-482°F	482-572°F	572-662°F	662-698°F	698+°F	698-842°F	842-932°F	932-1022°F	1022+°F
Client ID	PetroRio																
Date	September 16, 2022																
Test	Method	Unit															
Mass Yield	D2892	% Wt.		0.52	0.91	1.11	2.81	3.95	6.26	9.05	8.82	3.61	62.96	12.85	11.54	7.52	31.05
Volume Yield		% Vol.		0.90	1.28	1.40	3.37	4.48	6.81	9.53	9.03	3.62	59.58	12.63	11.19	7.25	28.51
API Gravity @ 60°F	D4052/D5002	°API	20.8		83.0	60.7	51.4	41.6	34.5	29.2	24.7	21.3	12.9	18.6	16.5	15.6	8.5
Specific Gravity, 60/60 °F			0.9289	0.5422	0.6596	0.7363	0.7739	0.8175	0.8525	0.8806	0.9059	0.9259	0.9798	0.9430	0.9558	0.9623	1.0106
Density @ 15°C		kg/l	0.9284		0.6595	0.7360	0.7736	0.8171	0.8521	0.8801	0.9054	0.9254	0.9792	0.9425	0.9553	0.9617	1.0100
Light Ends in Crude Oil	D7900		Pg. 8														
Simulated Distillation	D7169	% Wt.	Pg. 7														
Vapor Pressure	D6377	psi	4.99														
UOP K Factor	UOP 375						11.6	11.4	11.3	11.3	11.3	11.4	11.5	11.5	11.5	11.6	
Total Sulfur Content	D2622 / D4294	% Wt.	0.708		0.0031	0.0033	0.027	0.135	0.227	0.470	0.699	0.805	0.890	0.753	0.769	0.891	0.986
Hydrogen Sulfide in Liquid	UOP 163	ppmw	<1		<1	<1	<1	<1	<1	<1							
Mercaptans Sulfur	UOP 163	ppmw	36.6		15.5	10.8	7.6	12.3	8.8	7.8							
Total Nitrogen	D4629/5762	ppmw	3612							103	684	1854	5658	2201	2859	3834	7603
Basic Nitrogen	UOP 269	% Wt.								0.010	0.039	0.071	0.180	0.083	0.111	0.149	0.254
Organic Chlorides in Crude oil	D4929C	mg/kg	<1														
Total Acid Number	D8045	mgKOH/g	0.88						0.95	1.39	1.84	1.82	0.44	1.02	0.80	0.72	0.30
Viscosity @ 20°C	D445	cSt	186.7														
Viscosity @ 40°C	D445	cSt	59.76					1.093	1.808	3.459	8.651	19.26					
Viscosity @ 50°C	D445	cSt	37.53					0.9738	1.549	2.789	6.378	12.87		51.63	208.4	649.6	
Viscosity @ 100°C	D445	cSt											109.9	7.768	17.44	36.30	
Viscosity @ 130°C	D445	cSt											36.90				519.7
Research Octane Number	D2699					IR	IR										
Motor Octane Number	D2700					IR	IR										
Calculated Octane Number	D6730					69.7	82.3										
Detailed Hydrocarbon Analysis	D6730			Pg. 9	Pg. 10	Pg. 11	Pg. 12										
Paraffins	D6730	% Vol.		99.86	82.49	53.71	37.89										
Olefins	D6730	% Vol.		0.01	0.04	0.02	1.58										
Naphthenes	D6730	% Vol.		0.11	17.20	44.33	46.17										
Aromatics	D6730	% Vol.		0.01	0.25	1.75	8.38										
Unknowns	D6730	% Vol.		0.01	0.02	0.19	5.98										
Distillation	D86 / D1160	°F					Pg. 6	Pg. 6	Pg. 6	Pg. 6	Pg. 6	Pg. 6					
Pour Point	D5853/D97	°F	-27					<-27	<-27	<-27	<-27	<-27	48.2	10.4	26.6	53.6	162
Cloud Point	D2500	°F						<-76	<-76	<-76	-63.4	-23.8					
Freeze Point	D2386	°F						<-112	<-112	-98.7							
Wax Appearance Temperature	IP 389	°C	16.0														
Smoke Point	D1322	mm						23.9	14.9	12.6							
Cetane Index	D4737							24.9	34.8	39.4							
Naphthalenes	D1840	% Wt.							3.12	9.6							
Aniline Point	D611	°F								124.2	134.7	136.7		152	163.1	172.8	
Wax Content	UOP 46	% Wt.	1.3											1.5	1.0	2.9	
Asphaltenes	D6560	% Wt.	1.73										3.03	<0.5	<0.5		6.29
Micro Carbon Residue	D4530	% Wt.	5.29							<0.1	<0.1	<0.1	8.67	<0.1	0.22	1.80	17.9
Ramsbottom Carbon Residue	D524	% Wt.								<0.1	<0.1	<0.1		0.1	0.2		
Aromatics	D5291	% Wt.												51.55	52.31	56.9	
Metals - Vanadium	IP 501	ppmw	15										22				51.0
Nickel	IP 501	ppmw	7										10				26.0
Iron	IP 501	ppmw	2														

Notes: Cumulative Volume Yield results are normalized to 100% among fractions in proportion to their Yields
IR: Insufficient recovery to run analysis, Calculated Octane Number provided per D6730 Analysis.

Distillation Report (ASTM D86/D1160)

Sample ID	Frade Crude					
Lab ID	120-22-12664					
Client ID	PetroRio					
Date	September 16, 2022					
Cut Range	**212°F - 302°F**	**302°F - 392°F**	**392°F - 482°F**	**482°F - 572°F**	**572°F - 662°F**	**662°F - 698°F**
Description	°F	°F	°F	°F	°F	°F
IBP	235.9	323.4	413.0	501.1	590.2	644.0
Recovery @ 5%	244.8	331.6	424.7	511.4	600.6	675.3
Recovery @ 10%	247.3	333.0	425.9	511.5	604.0	676.8
Recovery @ 20%	250.8	336.0	427.8	514.2	604.5	678.0
Recovery @ 30%	254.1	338.8	430.4	516.5	605.6	679.5
Recovery @ 40%	257.5	341.9	433.2	519.1	607.2	679.6
Recovery @ 50%	261.5	345.3	436.2	522.0	609.9	680.4
Recovery @ 60%	265.4	349.2	439.8	525.8	612.5	683.2
Recovery @ 70%	270.3	354.1	444.0	530.3	616.5	685.0
Recovery @ 80%	276.3	360.5	449.3	536.4	621.4	689.4
Recovery @ 90%	285.0	369.7	456.8	545.9	628.5	691.2
Recovery @ 95%	292.3	377.8	463.2	555.9	635.2	695.3
FBP	315.3	390.5	470.4	557.3	640.6	698.5
	% vol	% vol	% vol	% vol	% vol	% vol
Recovery	97.9	97.8	98.5	96.0	98.2	98.4
Residue	1.0	1.1	1.2	1.3	1.4	1.3
Loss	1.1	1.1	0.3	2.7	0.4	0.3

Simulated Distillation Report (D7169)

Sample ID	Frade Crude
Lab ID	120-22-12664
Client ID	PetroRio
Date	September 16, 2022
Cut Range	Whole Crude

% Off	BP(F)
0.5	95.36
1	156.26
2	212.73
3	243.40
4	275.01
5	303.76
6	327.10
7	351.86
8	373.31
9	392.81
10	409.84
11	426.59
12	439.85
13	452.18
14	467.43
15	478.25
16	489.51
17	501.79
18	511.18
19	521.63
20	533.93
21	545.87
22	558.24
23	567.26
24	577.49
25	586.78
26	597.08
27	605.53
28	616.05
29	626.72
30	636.52

31	647.34
32	658.08
33	668.19
34	678.16
35	688.55
36	698.69
37	708.45
38	718.42
39	728.19
40	738.20
41	748.10
42	758.00
43	767.55
44	776.92
45	785.60
46	793.74
47	801.15
48	808.69
49	816.36
50	823.09
51	830.76
52	837.83
53	846.43
54	854.82
55	863.97
56	873.27
57	882.60
58	892.19
59	902.23
60	912.72
61	923.46
62	933.40
63	943.54
64	954.37
65	965.74
66	977.07
67	988.59
68	1000.32
69	1012.37
70	1025.36
71	1038.44
72	1051.36
73	1063.65
74	1076.52
75	1089.50
76	1102.40
77	1115.44

78	1128.99
79	1142.47
80	1156.33
81	1169.65
82	1182.83
83	1196.54
84	1209.69
85	1224.21
86	1240.80
87	1257.97
88	1274.45
89	1290.46
90	1306.07
91	1324.00
92	
93	
94	
95	
96	
97	
98	
99	
% Recovery	91.87
% Residue	8.13
FBP	1328.0

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Light Ends in Crude Oil (D7900)

Sample ID	Frade Crude
Lab ID	120-22-12664
Client ID	PetroRio
Date	September 16, 2022
Cut Range	Whole Crude

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
1.5095	200	P2	ethane	0.0211	0.0575	0.0664	-127.48	-88.6
1.5652	300	P3	propane	0.1065	0.1975	0.2288	-43.672	-42.04
1.6515	362.56	I4	i-butane	0.0925	0.1541	0.1508	10.904	-11.72
1.7252	400	P4	n-butane	0.1859	0.2982	0.3031	31.1	-0.5
1.7633	413.66	I5	2,2-dimethylpropane	0.0003	0.0004	0.0003	49.1	9.5
1.9944	473.64	I5	i-pentane	0.1667	0.2497	0.2189	82.112	27.84
2.1395	500	P5	n-pentane	0.2033	0.3015	0.2671	96.908	36.06
2.3946	534.98	I5	Carbon Disulfide(Diluent)	0	0	0	113	45
2.4222	538.2	I6	2,2-dimethylbutane	0.0038	0.0055	0.0042	121.514	49.73
2.6349	560.42		unknown	0.0029	0.0039	0.0032	121.514	49.73
2.7065	567.03	N5	cyclopentane	0.0398	0.0496	0.0538	120.65	49.25
2.7117	567.5	I6	2,3-dimethylbutane	0.0336	0.0472	0.037	136.364	57.98
2.7581	571.57	I6	2-methylpentane	0.1346	0.1914	0.148	140.468	60.26
2.9167	584.52	I6	3-methylpentane	0.0641	0.0895	0.0704	145.886	63.27
3.1309	600	P6	n-hexane	0.2966	0.4176	0.3262	155.714	68.73
3.1942	604.57		unknown	0.0036	0.0047	0.0039	155.714	68.73
3.2775	610.35		unknown	0.0016	0.0022	0.0018	155.714	68.73
3.3292	613.8		unknown	0.0008	0.001	0.0009	155.714	68.73
3.4217	619.76		unknown	0.0003	0.0004	0.0004	155.714	68.73
3.4975	624.44	I7	2,2-dimethylpentane	0.0102	0.0141	0.0097	174.542	79.19
3.5452	627.31	N6	methylcyclopentane	0.1722	0.2136	0.1939	161.24	71.8
3.5983	630.42	I7	2,4-dimethylpentane	0.0551	0.0761	0.0521	176.882	80.49
3.7017	636.25	I7	2,2,3-trimethylbutane	0.0012	0.0016	0.0011	177.584	80.88
3.9742	650.47	A6	benzene	0.0107	0.0114	0.013	176.162	80.09
4.08	655.59	I7	3,3-dimethylpentane	0.0081	0.0109	0.0077	186.908	86.06
4.1667	659.63	N6	cyclohexane	0.1364	0.1627	0.1536	177.296	80.72
4.348	667.69	I7	2-methylhexane	0.0442	0.0604	0.0418	194.09	90.05
4.3905	669.51	I7	2,3-dimethylpentane	0.0796	0.1063	0.0752	193.604	89.78
4.463	672.55	N7	1,1-dimethylcyclopentane	0.0244	0.03	0.0236	189.464	87.48
4.5539	676.26	I7	3-methylhexane	0.0866	0.117	0.0819	197.33	91.85
4.7195	682.75	N7	1c,3-dimethylcyclopentane	0.0816	0.1017	0.0788	195.386	90.77

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
4.791	685.46	N7	1t,3-dimethylcyclopentane	0.0733	0.0909	0.0707	197.096	91.72
4.8086	686.11	I7	3-ethylpentane	0.0164	0.0219	0.0155	200.246	93.47
4.8616	688.07	N7	1t,2-dimethylcyclopentane	0.153	0.189	0.1476	197.366	91.87
5.2028	700	P7	n-heptane	0.104	0.1412	0.0983	209.156	98.42
5.8142	721.87	N7	1c,2-dimethylcyclopentane	0.0257	0.0326	0.0248	211.154	99.53
5.8375	722.64	N7	methylcyclohexane	0.2806	0.3386	0.2708	213.674	100.93
5.9386	725.95	N8	1,1,3-trimethylcyclopentane	0.049	0.0608	0.0414	220.802	104.89
6.2336	735.19	N7	ethylcyclopentane	0.0629	0.0762	0.0607	218.246	103.47
6.2634	736.09	I8	2,5-dimethylhexane	0.0105	0.0141	0.0087	228.398	109.11
6.3383	738.33	I8	2,4-dimethylhexane	0.0264	0.0349	0.0219	228.974	109.43
6.5404	744.21	N8	1c,2t,4-trimethylcyclopentane	0.0713	0.0867	0.0602	242.132	116.74
6.5822	745.4	I8	3,3-dimethylhexane	0.0084	0.011	0.007	233.546	111.97
6.805	751.57	N8	1t,2c,3-trimethylcyclopentane	0.1141	0.1375	0.0963	230.738	110.41
6.9025	754.19	I8	2,3,4-trimethylpentane	0.072	0.0929	0.0597	236.246	113.47
6.9617	755.76		unknown	0.0001	0.0002	0.0001	236.246	113.47
7.0433	757.9	A7	toluene	0.0509	0.0545	0.0523	231.134	110.63
7.3348	765.28	I8	2,3-dimethylhexane	0.0385	0.0502	0.0319	240.098	115.61
7.3521	765.71	I8	2-methyl-3-ethylpentane	0.0198	0.0258	0.0164	240.098	115.61
7.4508	768.12		unknown	0.0005	0.0006	0.0004	240.098	115.61
7.5493	770.49	I8	2-methylheptane	0.0291	0.0388	0.0242	243.77	117.65
7.6061	771.83	I8	4-methylheptane	0.0249	0.0328	0.0207	243.878	117.71
7.6619	773.15	I8	3-methyl-3-ethylpentane	0.0096	0.0125	0.008	240.098	115.61
7.7633	775.5	N8	1c,2c,4-trimethylcyclopentane	0.0097	0.0118	0.0082	242.168	116.76
7.8391	777.23		unknown	0.021	0.0279	0.0178	242.168	116.76
7.8896	778.38	I8	3-methylheptane	0.1394	0.1834	0.1157	246.074	118.93
7.9108	778.86	N8	1c,2t,3-trimethylcyclopentane	0.031	0.0373	0.0262	243.5	117.5
7.9629	780.02	N8	1t,4-dimethylcyclohexane	0.0588	0.0716	0.0496	246.848	119.36
8.1746	784.68	N8	1,1-dimethylcyclohexane	0.0288	0.0343	0.0243	247.19	119.55
8.2653	786.63	I9	2,2,5-trimethylhexane	0.0012	0.0015	0.0009	255.362	124.09
8.3176	787.74	N8	3c-ethylmethylcyclopentane	0.0309	0.0374	0.0261	249.98	121.1
8.4021	789.52	N8	3t-ethylmethylcyclopentane	0.027	0.0326	0.0228	249.98	121.1

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
8.4514	790.55	N8	2t-ethylmethylcyclopentane	0.0801	0.0967	0.0676	250.16	121.2
8.5285	792.14	N8	1,1-methylethylcyclopentane	0.0053	0.0063	0.0044	250.754	121.53
8.6422	794.46	N8	1t,2-dimethylcyclohexane	0.1018	0.1218	0.086	254.174	123.43
8.9211	800	P8	n-octane	0.0913	0.1206	0.0757	258.224	125.68
9.1231	805.25	I9	I9-[1]	0.0004	0.0006	0.0003	258.224	125.68
9.2081	807.43	N8	i-propylcyclopentane	0.0216	0.0259	0.0183	259.574	126.43
9.3294	810.48		unknown	0.0006	0.0007	0.0005	259.574	126.43
9.3788	811.72		unknown	0.0004	0.0005	0.0003	259.574	126.43
9.4822	814.27	N8	N8-[1]	0.0083	0.0099	0.007	259.574	126.43
9.5839	816.75	I9	2,2,3,4-tetramethylpentane	0.0033	0.0041	0.0024	271.454	133.03
9.6596	818.58	I9	2,3,4-trimethylhexane	0.0106	0.0134	0.0079	282.308	139.06
9.74	820.5	N8	N8-[2]	0.0024	0.0031	0.0018	282.308	139.06
9.9292	824.95	N8	1c,2-dimethylcyclohexane	0.0364	0.0424	0.0307	265.532	129.74
9.9619	825.71		unknown	0.0094	0.0124	0.0277	265.532	129.74
10.0648	828.08	I9	2,2-dimethylheptane	0.0043	0.0056	0.0032	270.86	132.7
10.1778	830.65	N9	1,1,4-trimethylcyclohexane	0.1566	0.1883	0.1176	275	135
10.2445	832.15	I9	2,2,3-trimethylhexane	0.0249	0.0323	0.0184	271.22	132.9
10.3399	834.28	I9	2,4-dimethylheptane	0.01	0.013	0.0074	271.22	132.9
10.4405	836.5	I9	4,4-dimethylheptane	0.269	0.3491	0.1987	271.22	132.9
10.5641	839.19	I9	2,5-dimethylheptane	0.036	0.0467	0.0266	276.8	136
10.6256	840.52	I9	3,5-dimethylheptane	0.0054	0.0069	0.004	276.8	136
10.6967	842.04	I9	3,3-&3,5-dimethlyheptane	0.016	0.021	0.0119	275.396	135.22
10.7618	843.43	N9	1,1,3-trimethylcyclohexane	0.022	0.0259	0.0165	295.862	146.59
10.8424	845.13	N9	1c,2t,4t-trimethylcyclohexane	0.0135	0.0161	0.0102	32	0
11.0704	849.86	A8	ethylbenzene	0.0527	0.0564	0.047	277.16	136.2
11.1332	851.14	N9	1c,3c,5c-trimethylcyclohexane	0.0628	0.0748	0.0471	32	0
11.224	852.98		unknown	0.0705	0.0935	0.0529	32	0
11.334	855.19		unknown	0.0156	0.0206	0.0117	32	0
11.4415	857.33	I9	I9-[2]	0.0038	0.0049	0.0028	32	0
11.555	859.56	A8	1,3-dimethylbenzene	0.0443	0.0475	0.0395	282.416	139.12
11.6837	862.05	A8	1,4-dimethylbenzene	0.0612	0.0659	0.0546	281.048	138.36

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
11.7953	864.2	I9	2,3-dimethylheptane	0.0057	0.0073	0.0042	284.9	140.5
11.8733	865.68	I9	3,4 -dimethylheptane	0.0278	0.0353	0.0205	285.08	140.6
11.9492	867.11	N9	N9-[1]	0.0194	0.0231	0.0146	285.08	140.6
12.0199	868.43	I9	I9-[3]	0.0135	0.0172	0.01	285.08	140.6
12.145	870.76	I9	4-methyloctane	0.0134	0.016	0.0101	32	0
12.2032	871.83	I9	2-methyloctane	0.0088	0.0114	0.0065	289.904	143.28
12.3347	874.23	N9	1c,2t,3c-trimethylcyclohexane	0.0332	0.0406	0.0249	304.16	151.2
12.4732	876.72	I9	3-methyloctane	0.047	0.0605	0.0347	291.614	144.23
12.5546	878.17	I9	3,3-diethylpentane	0.0213	0.0261	0.0158	270.842	132.69
12.6347	879.59	N9	1c,2t,4c-trimethylcyclohexane	0.009	0.0108	0.0067	275	135
12.6986	880.72	N9	1,1,2-trimethylcyclohexane	0.0069	0.0081	0.0052	293.36	145.2
12.7584	881.76	A8	1,2-dimethylbenzene	0.0602	0.0635	0.0538	291.974	144.43
12.8353	883.1	I9	I9-[4]	0.0118	0.015	0.0087	291.974	144.43
12.9569	885.2	I9	I9-[5]	0.0043	0.0055	0.0032	291.974	144.43
13.0764	887.24	N9	N9-[2]	0.0641	0.0762	0.0481	291.974	144.43
13.1217	888.01	N9	N9-[3]	0.0686	0.0816	0.0515	291.974	144.43
13.2234	889.72	N9	N9-[4]	0.0416	0.0495	0.0312	291.974	144.43
13.3124	891.21		unknown	0.0032	0.0042	0.0024	291.974	144.43
13.3569	891.95	I9	I9-[6]	0.0097	0.0123	0.0072	291.974	144.43
13.4296	893.15	N9	i-butylcyclopentane	0.013	0.0155	0.0098	298.346	147.97
13.4692	893.8	N9	N9-[5]	0.0019	0.0023	0.0015	298.346	147.97
13.6584	896.89	N9	N9-[6]	0.0079	0.0094	0.0059	298.346	147.97
13.74	898.2		unknown	0.0025	0.0034	0.0019	298.346	147.97
13.7685	898.66	N9	N9-[7]	0.0129	0.0154	0.0097	298.346	147.97
13.8522	900	P9	n-nonane	0.045	0.0582	0.0333	303.476	150.82
13.9521	903.29	N9	1,1-methylethylcyclohexane	0.0739	0.0851	0.0555	305.924	152.18
14.047	906.39		unknown	0.0075	0.0099	0.0056	305.924	152.18
14.0699	907.14	N9	N9-[8]	0.0078	0.0092	0.0059	305.924	152.18
14.1346	909.24		unknown	0.0046	0.0061	0.0135	305.924	152.18
14.2474	912.87	A9	i-propylbenzene	0.014	0.0151	0.011	306.338	152.41
14.2754	913.77		unknown	0.0049	0.0065	0.0039	306.338	152.41

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
14.3714	916.83	N9	N9-[9]	0.0808	0.095	0.0607	306.338	152.41
14.4582	919.58	N9	i-propylcyclohexane	0.0343	0.0397	0.0257	310.622	154.79
14.5558	922.65	I10	2,4-dimethyloctane	0.0242	0.031	0.0161	312.62	155.9
14.6248	924.8	I10	2,2-dimethyloctane	0.0283	0.0362	0.0188	314.42	156.9
14.6731	926.3	N9	N9-[10]	0.0081	0.0096	0.0061	314.42	156.9
14.7205	927.77	N9	N9-[11]	0.002	0.0023	0.0015	314.42	156.9
14.793	930.01		unknown	0.0175	0.0232	0.0131	314.42	156.9
14.8777	932.61	I10	2,6-dimethyloctane	0.0892	0.1138	0.0594	320.738	160.41
14.9029	933.38	I10	2,5-dimethyloctane	0.0325	0.0413	0.0216	317.3	158.5
15.0391	937.51	N9	n-butylcyclopentane	0.0344	0.0407	0.0258	313.916	156.62
15.0982	939.29	N10	N10-[1]	0.0175	0.0203	0.0118	313.916	156.62
15.1713	941.49	I10	I10-[1]	0.0152	0.0193	0.0101	313.916	156.62
15.2295	943.22	I10	3,3-dimethyloctane	0.1031	0.1295	0.0687	322.16	161.2
15.2862	944.91	N10	N10-[2]	0.0603	0.07	0.0407	322.16	161.2
15.3127	945.69		unknown	0.0077	0.0103	0.0052	322.16	161.2
15.3581	947.04	A9	n-propylbenzene	0.0452	0.0487	0.0356	318.632	159.24
15.419	948.83	I10	3,6-dimethyloctane	0.0279	0.0352	0.0186	321.44	160.8
15.4687	950.29	I10	3-methyl-5-ethylheptane	0.0366	0.0468	0.0244	316.76	158.2
15.4925	950.99		unknown	0.0114	0.0151	0.0076	316.76	158.2
15.5516	952.71	N10	N10-[3]	0.0246	0.0285	0.0166	316.76	158.2
15.6228	954.78	A9	1,3-methylethylbenzene	0.0232	0.0249	0.0183	322.394	161.33
15.6591	955.83	A9	1,4-methylethylbenzene	0.0417	0.0449	0.0328	323.618	162.01
15.6852	956.58		unknown	0.0244	0.0324	0.0192	323.618	162.01
15.7322	957.94		unknown	0.004	0.0054	0.0032	323.618	162.01
15.8132	960.26		unknown	0.0994	0.1318	0.0784	323.618	162.01
15.8833	962.26	N10	N10-[4]	0.0228	0.0264	0.0154	323.618	162.01
15.905	962.87		unknown	0.0109	0.0144	0.0073	323.618	162.01
15.9495	964.14	A9	1,3,5-trimethylbenzene	0.0286	0.0307	0.0225	328.532	164.74
15.9706	964.73		unknown	0.0116	0.0153	0.0091	328.532	164.74
16.029	966.38	I10	2,3-dimethyloctane	0.0154	0.0194	0.0103	327.812	164.34
16.0539	967.08		unknown	0.0126	0.0167	0.0373	327.812	164.34

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
16.0961	968.27	I10	I10-[2]	0.0043	0.0054	0.0029	327.812	164.34
16.1542	969.89	I10	4-methylnonane	0.0116	0.0146	0.0077	32	0
16.1809	970.64	A9	1,2-methylethylbenzene	0.0524	0.0553	0.0413	329.324	165.18
16.2343	972.13	I10	2-methylnonane	0.0148	0.0189	0.0099	332.654	167.03
16.2833	973.48		unknown	0.0159	0.0211	0.0106	332.654	167.03
16.2982	973.9		unknown	0.0222	0.0295	0.0658	332.654	167.03
16.3377	974.99	I10	3-ethyloctane	0.017	0.0213	0.0113	331.7	166.5
16.3876	976.36	N10	N10-[5]	0.0299	0.0347	0.0202	331.7	166.5
16.4246	977.38		unknown	0.0303	0.0402	0.0205	331.7	166.5
16.4818	978.94	I10	3-methylnonane	0.0499	0.0631	0.0332	334.04	167.8
16.5674	981.27		unknown	0.0085	0.0112	0.0251	334.04	167.8
16.6554	983.66	A9	1,2,4-trimethylbenzene	0.0967	0.1025	0.0762	336.884	169.38
16.7112	985.16	N10	i-butylcyclohexane	0.0603	0.0703	0.0407	340.34	171.3
16.7889	987.25	I10	I10-[3]	0.0682	0.0855	0.0454	340.34	171.3
16.8193	988.06	I10	I10-[4]	0.0091	0.0115	0.0061	340.34	171.3
16.8625	989.21	I10	I10-[5]	0.0178	0.0223	0.0118	340.34	171.3
16.9066	990.39	I10	I10-[6]	0.033	0.0414	0.022	340.34	171.3
16.9414	991.31	I10	I10-[7]	0.0152	0.0191	0.0101	340.34	171.3
16.9863	992.5	N10	N10-[6]	0.0043	0.005	0.0029	340.34	171.3
17.0607	994.46	N10	1t-methyl-2-n-propylcyclohexane	0.0201	0.0233	0.0136	339.8	171
17.1078	995.7	A10	i-butylbenzene	0.0313	0.0341	0.0221	343.022	172.79
17.1775	997.52		unknown	0.0091	0.0121	0.027	343.022	172.79
17.2133	998.46	I10	I10-[8]	0.0188	0.0236	0.0125	343.022	172.79
17.2301	998.89	A10	sec-butylbenzene	0.0274	0.0295	0.0193	344.012	173.34
17.2725	1000	P10	n-decane	0.0323	0.041	0.0215	345.47	174.15

LPG Composition by GC (D6730 Mod)

Sample ID	Frade Crude
Lab ID	120-22-12664
Client ID	PetroRio
Date	September 16, 2022
Cut Range	IBP - 59°F

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
6.6378	100	P1	methane	0.0074	0.0134	0.0239	-258.7	-161.5
6.7951	200	P2	ethane	4.3317	6.5911	7.4569	-127.48	-88.6
7.2735	300	P3	propane	30.7153	32.8319	36.0563	-43.672	-42.04
8.1622	365.98	I4	i-butane	22.8442	22.006	20.3449	10.904	-11.72
8.7618	391.34	O4	isobutylene	0.0012	0.0011	0.0011	20.75	-6.25
9.0154	400	P4	n-butane	34.3794	31.9048	30.6181	31.1	-0.5
9.3712	412.81	O4	t-butene-2	0.0011	0.001	0.001	33.584	0.88
9.4444	415.24	I5	2,2-dimethylpropane	0.2285	0.2096	0.1639	49.1	9.5
11.2044	460.1	O5	3-methylbutene-1	0.0133	0.0115	0.0098	68.09	20.05
11.3594	463.18		unknown	0.0056	0.0049	0.0042	68.09	20.05
12.1175	476.94	I5	i-pentane	4.7834	4.1486	3.4319	82.112	27.84
13.6692	500	P5	n-pentane	2.2354	1.9215	1.6038	96.908	36.06
15.9907	540.4	I6	2,2-dimethylbutane	0.0129	0.0108	0.0077	121.514	49.73
17.9313	567.12	N5	cyclopentane	0.0912	0.0664	0.0673	120.65	49.25
18.091	569.11	I6	2,3-dimethylbutane	0.0319	0.0262	0.0192	136.364	57.98
18.4347	573.3	I6	2-methylpentane	0.1196	0.0993	0.0718	140.468	60.26
19.4911	585.46	I6	3-methylpentane	0.0451	0.0368	0.0271	145.886	63.27
20.8779	600	P6	n-hexane	0.0636	0.0523	0.0382	155.714	68.73
23.0639	626.66	N6	methylcyclopentane	0.0468	0.0339	0.0288	161.24	71.8
23.4425	630.92	I7	2,4-dimethylpentane	0.002	0.0016	0.001	176.882	80.49
26.1567	658.89	N6	cyclohexane	0.0128	0.0089	0.0079	177.296	80.72
27.2544	669.11	I7	2,3-dimethylpentane	0.0021	0.0016	0.0011	193.604	89.78
28.0189	675.91	I7	3-methylhexane	0.0015	0.0012	0.0008	197.33	91.85
28.7417	682.12	N7	1c,3-dimethylcyclopentane	0.002	0.0015	0.0011	195.386	90.77
29.0567	684.77	N7	1t,3-dimethylcyclopentane	0.0015	0.0011	0.0008	197.096	91.72
29.3706	687.37	I8	2,2,4-trimethylpentane	0.0013	0.001	0.0006	210.632	99.24
39.4606	753.15	A7	toluene	0.0193	0.0121	0.0108	231.134	110.63

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Naphtha Composition by GC (D6730)

Sample ID	Frade Crude
Lab ID	120-22-12664
Client ID	PetroRio
Date	September 16, 2022
Cut Range	59-149°F

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
6.7702	200	P2	ethane	0.012	0.0221	0.0309	-127.48	-88.6
7.2561	300	P3	propane	0.0696	0.0904	0.1226	-43.672	-42.04
8.1464	366.19	I4	i-butane	0.9571	1.1205	1.2793	10.904	-11.72
8.999	400	P4	n-butane	4.5452	5.1263	6.0755	31.1	-0.5
9.295	410.63	O4	vinyl acetylene	0.0005	0.0005	0.0007	32	0
9.365	412.97	O4	t-butene-2	0.0004	0.0004	0.0005	33.584	0.88
9.4276	415.02	I5	2,2-dimethylpropane	0.0919	0.1025	0.099	49.1	9.5
9.865	428.16	O4	c-butene-2	0.0002	0.0003	0.0003	38.696	3.72
11.1183	457.83		unknown	0.0053	0.0056	0.0073	38.696	3.72
11.355	462.49	O5	3-methylbutene-1	0.0021	0.0022	0.0024	68.09	20.05
12.1766	477.04	I5	i-pentane	15.4865	16.3235	16.6759	82.112	27.84
12.29	478.88		unknown	0.0016	0.0017	0.0018	82.112	27.84
13.07	490.6	O5	pentene-1	0.0004	0.0004	0.0004	85.928	29.96
13.2942	493.71		unknown	0.0003	0.0003	0.0003	85.928	29.96
13.4087	495.26		unknown	0.0036	0.0037	0.004	85.928	29.96
13.4828	496.25	O5	2-methylbutene-1	0.004	0.0041	0.0045	88.07	31.15
13.7713	500	P5	n-pentane	20.0026	20.8965	21.5389	96.908	36.06
14.2717	509.65	O5	t-pentene-2	0.0019	0.002	0.0022	97.412	36.34
14.4008	512.04		unknown	0.0004	0.0004	0.0004	97.412	36.34
14.7583	518.46	O5	c-pentene-2	0.0006	0.0006	0.0006	98.474	36.93
14.9329	521.49		unknown	0.0078	0.0078	0.0086	98.474	36.93
15.0652	523.75	O5	2-methylbutene-2	0.0033	0.0033	0.0036	101.408	38.56
15.9522	538.02	I6	2,2-dimethylbutane	0.5888	0.5977	0.5308	121.514	49.73
16.9237	552.17		unknown	0.0008	0.0008	0.0007	121.514	49.73
17.9659	565.94	N5	cyclopentane	5.4655	4.8312	6.0545	120.65	49.25
18.1088	567.72	I6	2,3-dimethylbutane	2.9946	2.9823	2.6998	136.364	57.98
18.5393	572.98	I6	2-methylpentane	13.5342	13.6541	12.2016	140.468	60.26
18.6317	574.08	O6	4-methyl-t-pentene-2	0.005	0.0049	0.0046	137.48	58.6
19.5435	584.54	I6	3-methylpentane	6.4747	6.4219	5.8372	145.886	63.27
19.725	586.53		unknown	0.0024	0.0024	0.0022	145.886	63.27
21.0191	600	P6	n-hexane	13.5004	13.4898	12.1711	155.714	68.73

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
21.1961	602.33	O6	t-hexene-3	0.0029	0.0028	0.0027	152.744	67.08
21.3922	604.88	O6	c-hexene-3	0.002	0.0019	0.0019	151.592	66.44
21.58	607.29	O6	2-methylpentene-2	0.0019	0.0018	0.0018	153.14	67.3
21.7278	609.17	O6	4-methylcyclopentene	0.001	0.0009	0.0009	148.82	64.9
21.8327	610.49	O6	3-methyl-c-pentene-2	0.0019	0.0018	0.0018	153.842	67.69
22.1592	614.55	O6	c-hexene-2	0.0007	0.0007	0.0007	155.984	68.88
22.2856	616.1	O6	O6-[1]	0.0018	0.0018	0.0017	155.984	68.88
22.6675	620.7		unknown	0.0008	0.0007	0.0007	155.984	68.88
22.7283	621.42	O6	3-methyl-t-pentene-2	0.0018	0.0017	0.0017	158.774	70.43
22.8825	623.24	I7	2,2-dimethylpentane	0.1385	0.1355	0.1074	174.542	79.19
23.1786	626.69	N6	methylcyclopentane	10.8504	9.5501	10.0164	161.24	71.8
23.4643	629.96	I7	2,4-dimethylpentane	0.3925	0.3844	0.3043	176.882	80.49
23.8705	634.51	I7	2,2,3-trimethylbutane	0.0295	0.0281	0.0228	177.584	80.88
24.3837	640.11		unknown	0.0003	0.0003	0.0002	177.584	80.88
25.0839	647.5	O7	2,4-dimethylpentene-1	0.0008	0.0008	0.0007	178.88	81.6
25.2678	649.39	O6	1-methylcyclopentene	0.0021	0.0017	0.0019	167.864	75.48
25.4782	651.53	A6	benzene	0.3181	0.2385	0.3164	176.162	80.09
25.7569	654.33	I7	3,3-dimethylpentane	0.0324	0.0308	0.0251	186.908	86.06
25.9583	656.34	O7	2-methyl-c-hexene-3	0.0007	0.0007	0.0006	186.8	86
26.1993	658.7	N6	cyclohexane	2.6697	2.2595	2.4645	177.296	80.72
27.1072	667.36	I7	2-methylhexane	0.1849	0.1795	0.1433	194.09	90.05
27.2586	668.77	I7	2,3-dimethylpentane	0.3318	0.3145	0.2573	193.604	89.78
27.5723	671.65	N7	1,1-dimethylcyclopentane	0.1094	0.0956	0.0866	189.464	87.48
28.0365	675.84	I7	3-methylhexane	0.2169	0.208	0.1681	197.33	91.85
28.7507	682.11	N7	1c,3-dimethylcyclopentane	0.2511	0.2221	0.1987	195.386	90.77
29.0727	684.87	N7	1t,3-dimethylcyclopentane	0.1891	0.1664	0.1496	197.096	91.72
29.204	685.98	I7	3-ethylpentane	0.0251	0.0237	0.0195	200.246	93.47
29.3906	687.55	I8	2,2,4-trimethylpentane	0.3198	0.3045	0.2175	210.632	99.24
30.9228	700	P7	n-heptane	0.0475	0.0458	0.0369	209.156	98.42
33.5306	718.03	N7	1c,2-dimethylcyclopentane	0.008	0.0072	0.0063	211.154	99.53
33.6304	718.69	N7	methylcyclohexane	0.0763	0.0654	0.0604	213.674	100.93

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
34.03	721.29	N8	1,1,3-trimethylcyclopentane	0.003	0.0027	0.0021	220.802	104.89
35.3942	729.88	I8	2,5-dimethylhexane	0.0091	0.0086	0.0062	228.398	109.11
35.7572	732.1	I8	2,4-dimethylhexane	0.0007	0.0006	0.0005	228.974	109.43
36.69	737.68	N8	1c,2t,4-trimethylcyclopentane	0.0016	0.0014	0.0011	242.132	116.74
37.9317	744.84	N8	1t,2c,3-trimethylcyclopentane	0.0025	0.0021	0.0017	230.738	110.41
38.3725	747.31	I8	2,3,4-trimethylpentane	0.0007	0.0006	0.0004	236.246	113.47
39.5467	753.74	A7	toluene	0.0089	0.0068	0.0075	231.134	110.63

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Naphtha Composition by GC (D6730)

Sample ID	Frade Crude
Lab ID	120-22-12664
Client ID	PetroRio
Date	September 16, 2022
Cut Range	149-212°F

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
6.7795	200	P2	ethane	0.0021	0.0043	0.0069	-127.48	-88.6
7.2651	300	P3	propane	0.0113	0.0161	0.0251	-43.672	-42.04
8.162	366.25	I4	i-butane	0.0352	0.0452	0.0593	10.904	-11.72
9.0159	400	P4	n-butane	0.1037	0.1284	0.1747	31.1	-0.5
9.4489	415.35	I5	2,2-dimethylpropane	0.0016	0.002	0.0022	49.1	9.5
9.8771	428.38	O4	c-butene-2	0.0001	0.0001	0.0002	38.696	3.72
11.3552	463.02	O5	3-methylbutene-1	0.0019	0.0022	0.0027	68.09	20.05
12.1272	477.01	I5	i-pentane	0.2426	0.2807	0.3291	82.112	27.84
13.6771	500	P5	n-pentane	0.3667	0.4205	0.4975	96.908	36.06
14.2664	511.33	O5	t-pentene-2	0.0002	0.0002	0.0003	97.412	36.34
14.7618	520.2	O5	c-pentene-2	0.0001	0.0002	0.0002	98.474	36.93
14.9447	523.34	O5	2-methylbutene-2	0.0003	0.0003	0.0004	101.408	38.56
15.978	539.87	I6	2,2-dimethylbutane	0.0266	0.0296	0.0302	121.514	49.73
16.935	553.63		unknown	0.0003	0.0003	0.0003	121.514	49.73
17.2308	557.63	O5	cyclopentene	0.0003	0.0002	0.0004	111.614	44.23
17.9259	566.6	N5	cyclopentane	0.3849	0.3734	0.5372	120.65	49.25
18.0709	568.4	I6	2,3-dimethylbutane	0.2743	0.2999	0.3116	136.364	57.98
18.4321	572.79	I6	2-methylpentane	1.3763	1.5239	1.5631	140.468	60.26
18.5933	574.71	O6	4-methyl-t-pentene-2	0.0008	0.0009	0.001	137.48	58.6
19.4784	584.79	I6	3-methylpentane	0.9989	1.0874	1.1345	145.886	63.27
19.7283	587.51		unknown	0.0006	0.0006	0.0006	145.886	63.27
20.9379	600	P6	n-hexane	4.514	4.9505	5.1269	155.714	68.73
21.3892	605.79	O6	t-hexene-2	0.0003	0.0004	0.0004	154.184	67.88
21.5797	608.19	O6	2-methylpentene-2	0.0003	0.0003	0.0003	153.14	67.3
21.7131	609.85	O6	3-methyl-c-pentene-2	0.0002	0.0003	0.0003	153.842	67.69
21.8125	611.08	O6	3-methylcyclopentene	0.0003	0.0003	0.0004	149	65
22.13	614.94	O6	c-hexene-2	0.0002	0.0002	0.0002	155.984	68.88
22.275	616.68	O6	O6-[1]	0.001	0.0011	0.0012	155.984	68.88
22.6603	621.22	O6	3-methyl-t-pentene-2	0.0004	0.0004	0.0005	158.774	70.43
22.7225	621.95		unknown	0.0009	0.001	0.0011	158.774	70.43
22.8665	623.61	I7	2,2-dimethylpentane	0.2946	0.3162	0.2878	174.542	79.19

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
23.1503	626.85	N6	methylcyclopentane	7.2085	6.9636	8.3834	161.24	71.8
23.4578	630.29	I7	2,4-dimethylpentane	1.0889	1.1706	1.0636	176.882	80.49
23.8485	634.58	I7	2,2,3-trimethylbutane	0.0871	0.0913	0.0851	177.584	80.88
24.3658	640.11	O7	cyclic diolefin or triolefin-[2]	0.0009	0.0009	0.0011	32	0
25.2717	649.42	O6	1-methylcyclopentene	0.0022	0.0021	0.0026	167.864	75.48
25.5001	651.69	A6	benzene	0.1719	0.1415	0.2154	176.162	80.09
25.7522	654.17	I7	3,3-dimethylpentane	0.2526	0.2635	0.2468	186.908	86.06
25.9317	655.92	O7	3-methylhexene-1	0.0006	0.0006	0.0006	183.02	83.9
26.283	659.29	N6	cyclohexane	8.4481	7.8476	9.8251	177.296	80.72
26.4697	661.05	O7	2-methyl-t-hexene-3	0.001	0.001	0.001	186.62	85.9
26.7625	663.79	O7	4-methylhexene-1	0.0004	0.0004	0.0004	188.114	86.73
27.2651	668.4	I7	2,3-dimethylpentane	4.372	4.5485	4.2706	193.604	89.78
27.4014	669.63	I7	2-methylhexane	4.5716	4.8718	4.4655	194.09	90.05
27.665	671.98	N7	1,1-dimethylcyclopentane	1.3648	1.3081	1.3605	189.464	87.48
28.1697	676.41	I7	3-methylhexane	5.7047	6.0041	5.5723	197.33	91.85
28.6042	680.14	O7	3,4-dimethyl-c-pentene-2	0.0023	0.0024	0.0023	192.65	89.25
28.886	682.52	N7	1t,3-dimethylcyclopentane	5.6612	5.4674	5.6433	197.096	91.72
29.2229	685.33	I7	3-ethylpentane	5.2687	5.4579	5.1464	200.246	93.47
29.417	686.93	N7	1t,2-dimethylcyclopentane	0.8549	0.8228	0.8522	197.366	91.87
29.6096	688.5	I8	2,2,4-trimethylpentane	9.2165	9.633	7.8971	210.632	99.24
30.5575	696.06		unknown	0.0006	0.0006	0.0005	210.632	99.24
31.0671	700	P7	n-heptane	5.0898	5.3836	4.9717	209.156	98.42
31.3053	701.73	O7	c-heptene-3	0.0024	0.0025	0.0024	204.35	95.75
31.4425	702.73	O7	t-heptene-2	0.0003	0.0004	0.0003	208.31	97.95
31.6753	704.4	O7	3-ethylpentene-2	0.0008	0.0008	0.0008	204.818	96.01
32.1131	707.51	O7	2,3-dimethylpentene-2	0.0005	0.0005	0.0005	207.32	97.4
32.365	709.27	O7	c-heptene-2	0.0018	0.0018	0.0018	209.138	98.41
32.9033	712.98	O7	3-ethylcyclopentene	0.0011	0.001	0.0011	207.986	97.77
33.5567	717.38	N7	1c,2-dimethylcyclopentane	0.1391	0.1374	0.1387	211.154	99.53
33.9145	719.75	N7	methylcyclohexane	14.1368	13.2872	14.0922	213.674	100.93
34.1353	721.19	N8	1,1,3-trimethylcyclopentane	1.0754	1.0394	0.938	220.802	104.89

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
34.6246	724.35		unknown	0.0008	0.0008	0.0007	220.802	104.89
34.9917	726.69		unknown	0.0003	0.0002	0.0002	220.802	104.89
35.4739	729.71	I8	2,5-dimethylhexane	2.8485	2.9703	2.4407	228.398	109.11
35.6467	730.78	I8	2,2,3-trimethylpentane	0.0222	0.0224	0.019	229.73	109.85
35.7616	731.49	I8	2,4-dimethylhexane	0.5522	0.5703	0.4732	228.974	109.43
36.7495	737.47	N8	1c,2t,4-trimethylcyclopentane	1.864	1.7658	1.6259	242.132	116.74
36.8783	738.23	I8	3,3-dimethylhexane	0.0868	0.0884	0.0744	233.546	111.97
38.0093	744.81	N8	1t,2c,3-trimethylcyclopentane	2.6396	2.4778	2.3024	230.738	110.41
38.4029	747.05	I8	2,3,4-trimethylpentane	1.098	1.1044	0.9408	236.246	113.47
38.6853	748.63		unknown	0.011	0.0111	0.0094	236.246	113.47
39.111	751	I8	2,3,3-trimethylpentane	0.0696	0.0693	0.0597	238.586	114.77
39.597	753.66	A7	toluene	1.8328	1.5287	1.9469	231.134	110.63
40.0519	756.12		unknown	0.0005	0.0004	0.0005	231.134	110.63
40.374	757.84	I8	2,3-dimethylhexane	0.231	0.2346	0.1979	240.098	115.61
40.5747	758.9	I8	2-methyl-3-ethylpentane	0.6133	0.6229	0.5255	240.098	115.61
41.0575	761.43		unknown	0.0006	0.0006	0.0005	240.098	115.61
41.5355	763.9	I8	2-methylheptane	0.3441	0.3565	0.2948	243.77	117.65
41.8401	765.46	I8	4-methylheptane	0.2542	0.2609	0.2178	243.878	117.71
42.0881	766.72	I8	3-methyl-3-ethylpentane	0.0397	0.0403	0.034	240.098	115.61
42.1942	767.26	I8	3,4-dimethylhexane	0.0645	0.0649	0.0553	243.914	117.73
42.7486	770.03	N8	1c,2c,4-trimethylcyclopentane	0.0514	0.0488	0.0448	242.168	116.76
42.7779	770.17		unknown	0.0572	0.0542	0.0498	242.168	116.76
43.0964	771.75	I8	3-methylheptane	0.2201	0.2255	0.1886	246.074	118.93
43.315	772.82		unknown	0.0844	0.0865	0.0723	246.074	118.93
43.3368	772.93		unknown	0.0294	0.0302	0.0252	246.074	118.93
43.4938	773.69	N8	1c,2t,3-trimethylcyclopentane	0.8691	0.8158	0.758	243.5	117.5
43.6402	774.4	I8	3-ethylhexane	0.2337	0.2368	0.2002	245.372	118.54
43.8883	775.6	N8	1t,4-dimethylcyclohexane	0.3632	0.3445	0.3168	246.848	119.36
45.0763	781.23	N8	1,1-dimethylcyclohexane	0.1908	0.1767	0.1664	247.19	119.55
45.3833	782.65	I9	2,2,5-trimethylhexane	0.0039	0.004	0.003	255.362	124.09
45.8625	784.86	N8	3c-ethylmethylcyclopentane	0.1945	0.1834	0.1697	249.98	121.1

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
46.3598	787.11	N8	3t-ethylmethylcyclopentane	0.1621	0.1529	0.1414	249.98	121.1
46.6751	788.53	N8	2t-ethylmethylcyclopentane	0.4791	0.4505	0.4179	250.16	121.2
47.2132	790.92	N8	1,1-methylethylcyclopentane	0.0202	0.0187	0.0176	250.754	121.53
47.8342	793.65	N8	1t,2-dimethylcyclohexane	0.3682	0.3432	0.3212	254.174	123.43
49.3192	800	P8	n-octane	0.1407	0.1448	0.1206	258.224	125.68
49.6703	801.36	N8	1c,4-dimethylcyclohexane	0.1133	0.1047	0.0988	255.794	124.33
51.0458	806.61	I9	I9-[1]	0.0018	0.0018	0.0014	32	0
51.4192	808	N8	i-propylcyclopentane	0.0436	0.0406	0.038	259.574	126.43
52.4271	811.71		unknown	0.0028	0.0026	0.0024	259.574	126.43
53.0868	814.1	I9	2,2,3,4-tetramethylpentane	0.0097	0.0095	0.0074	271.454	133.03
53.6879	816.24	I9	2,3,4-trimethylhexane	0.0033	0.0032	0.0025	282.308	139.06
54.4064	818.77	N8	N8-[1]	0.0172	0.016	0.015	282.308	139.06
54.7564	819.99	N8	N8-[2]	0.0009	0.0008	0.0008	282.308	139.06
56.0442	824.39	I9	2,3,5-trimethylhexane	0.0086	0.0087	0.0066	268.43	131.35
56.1769	824.84	I9	2,2-dimethylheptane	0.0279	0.0284	0.0213	270.86	132.7
56.8915	827.22	N8	1c,2-dimethylcyclohexane	0.002	0.0018	0.0018	265.532	129.74
57.7758	830.13	N9	1,1,4-trimethylcyclohexane	0.1273	0.1192	0.0987	275	135
58.0817	831.13	I9	2,2,3-trimethylhexane	0.0089	0.009	0.0068	271.22	132.9
58.7431	833.26	I9	2,4-dimethylheptane	0.0026	0.0026	0.002	271.22	132.9
59.3797	835.28	I9	4,4-dimethylheptane	0.0803	0.0812	0.0613	271.22	132.9
60.2708	838.08	I9	2,5-dimethylheptane	0.0097	0.0098	0.0074	276.8	136
61.1608	840.82	I9	2,6-dimethylheptane	0.0034	0.0035	0.0026	275.396	135.22
61.5942	842.14	N9	1,1,3-trimethylcyclohexane	0.0044	0.004	0.0034	295.862	146.59
62.1821	843.91	N9	1c,2t,4t-trimethylcyclohexane	0.0024	0.0022	0.0018	32	0
63.6192	848.17		unknown	0.0048	0.0045	0.0037	32	0
64.1583	849.74	N8	N8-[3]	0.0128	0.0119	0.0112	32	0
64.5933	851	A8	ethylbenzene	0.0503	0.0419	0.0464	277.16	136.2
65.6981	854.15	N9	1c,3c,5c-trimethylcyclohexane	0.0022	0.002	0.0017	32	0
67.9458	860.38	A8	1,3-dimethylbenzene	0.0269	0.0225	0.0248	282.416	139.12
68.3487	861.47	A8	1,4-dimethylbenzene	0.0087	0.0073	0.008	281.048	138.36
69.435	864.38	I9	3,4 -dimethylheptane	0.0048	0.0047	0.0037	285.08	140.6
72.8465	873.2	N9	1c,2t,3c-trimethylcyclohexane	0.0015	0.0015	0.0012	304.16	151.2
73.785	875.55	I9	3-ethylheptane	0.001	0.001	0.0008	289.4	143
76.9417	883.21	A8	1,2-dimethylbenzene	0.0057	0.0047	0.0053	291.974	144.43

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Naphtha Composition by GC (D6730)

Sample ID	Frade Crude
Lab ID	120-22-12664
Client ID	PetroRio
Date	September 16, 2022
Cut Range	212-302°F

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
6.7792	200	P2	ethane	0.0007	0.0014	0.0026	-127.48	-88.6
7.2643	300	P3	propane	0.0012	0.0017	0.0031	-43.672	-42.04
8.1607	366.25	I4	i-butane	0.0077	0.0103	0.0154	10.904	-11.72
8.7787	392.05	O4	butene-1	0.0002	0.0003	0.0004	20.75	-6.25
9.0146	400	P4	n-butane	0.0272	0.0353	0.0545	31.1	-0.5
9.3678	412.68	O4	t-butene-2	0.0003	0.0003	0.0006	33.584	0.88
9.4483	415.35	I5	2,2-dimethylpropane	0.0003	0.0004	0.0005	49.1	9.5
9.8689	428.14	O4	c-butene-2	0.0004	0.0005	0.0009	38.696	3.72
12.1354	477.04	I5	i-pentane	0.0295	0.0357	0.0475	82.112	27.84
12.2217	478.48		unknown	0.0002	0.0002	0.0002	82.112	27.84
13.0444	491.15	O5	pentene-1	0.0007	0.0009	0.0012	85.928	29.96
13.4742	497.14	O5	2-methylbutene-1	0.0001	0.0002	0.0002	88.07	31.15
13.6886	500	P5	n-pentane	0.0242	0.0291	0.0391	96.908	36.06
14.2555	511	O5	t-pentene-2	0.0013	0.0015	0.0021	97.412	36.34
14.749	519.93	O5	c-pentene-2	0.0008	0.0009	0.0013	98.474	36.93
15.0506	525.13	O5	2-methylbutene-2	0.0004	0.0004	0.0006	101.408	38.56
15.9992	540.34	O5	cyclopentadiene	0.0007	0.0008	0.0013	32	0
17.2117	557.69	O5	cyclopentene	0.0022	0.0021	0.0037	111.614	44.23
17.545	562.11	O6	3-methylpentene-1	0.0004	0.0005	0.0006	129.506	54.17
17.9344	567.11	N5	cyclopentane	0.0145	0.0148	0.0241	120.65	49.25
18.0922	569.09	I6	2,3-dimethylbutane	0.0066	0.0076	0.0089	136.364	57.98
18.4343	573.28	I6	2-methylpentane	0.0271	0.0314	0.0366	140.468	60.26
19.4852	585.44	I6	3-methylpentane	0.0209	0.0238	0.0282	145.886	63.27
19.9617	590.63	O6	2-methylpentene-1	0.0002	0.0002	0.0002	143.78	62.1
20.0506	591.58	O6	hexene-1	0.0015	0.0017	0.0021	146.246	63.47
20.866	600	P6	n-hexane	0.0729	0.0837	0.0984	155.714	68.73
21.1528	603.73	O6	t-hexene-3	0.0009	0.001	0.0012	152.744	67.08
21.3517	606.28	O6	t-hexene-2	0.0018	0.002	0.0025	154.184	67.88
21.62	609.66	O6	2-methylpentene-2	0.0013	0.0014	0.0018	153.14	67.3
21.8925	613.03	O6	3-methyl-c-pentene-2	0.0009	0.0009	0.0012	153.842	67.69
22.1083	615.67	O6	c-hexene-2	0.0006	0.0006	0.0008	155.984	68.88

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
22.8597	624.54	I7	2,2-dimethylpentane	0.0062	0.0069	0.0071	174.542	79.19
23.0452	626.67	N6	methylcyclopentane	0.2138	0.2161	0.2954	161.24	71.8
23.4187	630.89	I7	2,4-dimethylpentane	0.0243	0.0273	0.0282	176.882	80.49
23.8467	635.6	I7	2,2,3-trimethylbutane	0.0028	0.0031	0.0033	177.584	80.88
25.2458	650.24	O6	1-methylcyclopentene	0.0012	0.0012	0.0017	167.864	75.48
25.4602	652.39	A6	benzene	0.0106	0.0091	0.0157	176.162	80.09
25.7327	655.08	I7	3,3-dimethylpentane	0.0127	0.0138	0.0147	186.908	86.06
26.1364	659	N6	cyclohexane	0.3995	0.3884	0.552	177.296	80.72
26.7625	664.92	O7	4-methylhexene-1	0.0008	0.0008	0.0009	188.114	86.73
27.0788	667.84	I7	2-methylhexane	0.2183	0.2434	0.2533	194.09	90.05
27.2309	669.23	I7	2,3-dimethylpentane	0.3903	0.4249	0.4529	193.604	89.78
27.5399	672.02	N7	1,1-dimethylcyclopentane	0.1022	0.1025	0.121	189.464	87.48
28.01	676.18	I7	3-methylhexane	0.481	0.5297	0.5582	197.33	91.85
28.493	680.37	O7	3,4-dimethyl-c-pentene-2	0.0006	0.0007	0.0007	192.65	89.25
28.7238	682.34	N7	1c,3-dimethylcyclopentane	0.5496	0.5584	0.6509	195.386	90.77
29.047	685.06	N7	1t,3-dimethylcyclopentane	0.5578	0.5637	0.6606	197.096	91.72
29.1854	686.21	I7	3-ethylpentane	0.1073	0.1163	0.1245	200.246	93.47
29.3798	687.82	I8	2,2,4-trimethylpentane	1.0483	1.1466	1.0672	210.632	99.24
29.5683	689.37	O7	2-ethylpentene-1	0.0018	0.0019	0.0021	200.552	93.64
30.7328	698.65	O7	t-heptene-3	0.001	0.0011	0.0012	204.206	95.67
30.9067	700	P7	n-heptane	0.9875	1.0929	1.146	209.156	98.42
31.1683	701.89		unknown	0.0013	0.0014	0.0015	209.156	98.42
31.6133	705.06	O7	3-ethylpentene-2	0.0018	0.0019	0.0022	204.818	96.01
32.3047	709.88	O7	c-heptene-2	0.0006	0.0006	0.0007	209.138	98.41
32.7572	712.96	O7	3-ethylcyclopentene	0.0011	0.001	0.0013	207.986	97.77
33.5	717.91	N7	1c,2-dimethylcyclopentane	0.0857	0.0886	0.1015	211.154	99.53
33.7307	719.42	N7	methylcyclohexane	5.0834	4.9998	6.0205	213.674	100.93
33.8726	720.34	I8	2,2-dimethylhexane	0.0326	0.0355	0.0332	224.312	106.84
34.0082	721.22	N8	1,1,3-trimethylcyclopentane	0.5823	0.5889	0.6034	220.802	104.89
35.3771	729.83	I8	2,5-dimethylhexane	1.4355	1.5664	1.4614	228.398	109.11
35.5983	731.18	I8	2,2,3-trimethylpentane	0.0417	0.0441	0.0424	229.73	109.85

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
35.6978	731.79	I8	2,4-dimethylhexane	0.4505	0.4868	0.4586	228.974	109.43
35.9183	733.12		unknown	0.0006	0.0006	0.0006	228.974	109.43
36.6936	737.74	N8	1c,2t,4-trimethylcyclopentane	1.7545	1.7392	1.8182	242.132	116.74
36.8238	738.5	I8	3,3-dimethylhexane	0.1111	0.1184	0.1131	233.546	111.97
37.3367	741.47		unknown	0.0003	0.0003	0.0003	233.546	111.97
37.9811	745.14	N8	1t,2c,3-trimethylcyclopentane	2.9289	2.877	3.0352	230.738	110.41
38.3883	747.42	I8	2,3,4-trimethylpentane	1.7049	1.7944	1.7356	236.246	113.47
38.6433	748.83		unknown	0.0076	0.008	0.0078	236.246	113.47
39.0652	751.14	I8	2,3,3-trimethylpentane	0.1377	0.1435	0.1402	238.586	114.77
39.5218	753.61	A7	toluene	1.0147	0.8857	1.2806	231.134	110.63
39.8633	755.43		unknown	0.0015	0.0013	0.0019	231.134	110.63
40.3573	758.04	I8	2,3-dimethylhexane	0.4914	0.5223	0.5003	240.098	115.61
40.5592	759.09	I8	2-methyl-3-ethylpentane	1.2309	1.3081	1.2531	240.098	115.61
41.015	761.45		unknown	0.0041	0.0044	0.0042	240.098	115.61
41.5433	764.14	I8	2-methylheptane	0.9888	1.0722	1.0066	243.77	117.65
41.8746	765.81	I8	4-methylheptane	0.7819	0.8398	0.796	243.878	117.71
42.1759	767.31	I8	3,4-dimethylhexane	0.2935	0.3089	0.2988	243.914	117.73
42.7549	770.16	N8	1c,3-dimethylcyclohexane	0.3192	0.3168	0.3308	246.848	119.36
43.2223	772.43	I8	3-methylheptane	0.9397	1.0075	0.9566	246.074	118.93
43.5054	773.79		unknown	1.3111	1.4058	1.3348	246.074	118.93
43.6714	774.59	N8	1c,2t,3-trimethylcyclopentane	3.4172	3.3566	3.5412	243.5	117.5
43.7415	774.92	I8	3-ethylhexane	0.5797	0.6147	0.5901	245.372	118.54
44.0031	776.16	N8	1t,4-dimethylcyclohexane	1.6772	1.6645	1.7381	246.848	119.36
45.1019	781.28	N8	1,1-dimethylcyclohexane	0.9117	0.8835	0.9448	247.19	119.55
45.41	782.69	I9	2,2,5-trimethylhexane	0.0337	0.036	0.0305	255.362	124.09
45.8969	784.89	N8	3c-ethylmethylcyclopentane	1.0496	1.0356	1.0877	249.98	121.1
46.416	787.21	N8	3t-ethylmethylcyclopentane	0.9605	0.9476	0.9953	249.98	121.1
46.808	788.94	N8	2t-ethylmethylcyclopentane	2.6045	2.563	2.6991	250.16	121.2
47.2336	790.8	N8	1,1-methylethylcyclopentane	0.1274	0.1234	0.132	250.754	121.53
48.0314	794.24	N8	1t,2-dimethylcyclohexane	3.3635	3.28	3.4856	254.174	123.43
48.7825	797.41		unknown	0.0007	0.0007	0.0007	254.174	123.43

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
49.404	800	P8	n-octane	1.8971	2.0436	1.9313	258.224	125.68
49.7421	801.31	N8	1c,4-dimethylcyclohexane	1.1662	1.1274	1.2086	255.794	124.33
50.46	804.07		unknown	0.0011	0.001	0.0011	255.794	124.33
51.0267	806.22	I9	I9-[1]	0.024	0.0249	0.0217	32	0
51.4298	807.73	N8	i-propylcyclopentane	0.7395	0.7207	0.7663	259.574	126.43
52.4033	811.33		unknown	0.0516	0.0503	0.0535	259.574	126.43
53.0215	813.57	I9	2,2,3,4-tetramethylpentane	0.2823	0.2891	0.256	271.454	133.03
53.6707	815.9	I9	2,3,4-trimethylhexane	0.1203	0.1231	0.109	282.308	139.06
54.0611	817.28		unknown	0.0026	0.0026	0.0023	282.308	139.06
54.3732	818.38	N8	N8-[1]	0.3697	0.3587	0.3832	282.308	139.06
54.7583	819.72	N8	N8-[2]	0.1002	0.0972	0.1038	282.308	139.06
55.0928	820.88		unknown	0.0022	0.0022	0.0023	282.308	139.06
56.1133	824.37	I9	2,3,5-trimethylhexane	0.5154	0.5403	0.4673	268.43	131.35
56.1606	824.53	I9	2,2-dimethylheptane	1.018	1.0842	0.923	270.86	132.7
56.87	826.9	N8	1c,2-dimethylcyclohexane	0.1501	0.1426	0.1555	265.532	129.74
58.0955	830.93	N9	1,1,4-trimethylcyclohexane	5.2493	5.1442	4.8354	275	135
58.3444	831.74	I9	2,2,3-trimethylhexane	0.7027	0.7434	0.6371	271.22	132.9
58.8494	833.37	I9	2,4-dimethylheptane	0.2769	0.2929	0.251	271.22	132.9
59.9937	836.99	I9	4,4-dimethylheptane	8.3378	8.8208	7.5597	271.22	132.9
60.4631	838.46	I9	2,5-dimethylheptane	1.0384	1.0964	0.9415	276.8	136
60.7886	839.47	N9	*1c,3c,5-trimethylcyclohexane	0.1633	0.1606	0.1505	281.174	138.43
61.2298	840.82	I9	2,6-dimethylheptane	0.4819	0.5144	0.4369	275.396	135.22
61.68	842.2	N9	1,1,3-trimethylcyclohexane	0.6715	0.6457	0.6186	295.862	146.59
62.2113	843.8	N9	1c,2t,4t-trimethylcyclohexane	0.3838	0.3724	0.3535	32	0
63.3139	847.09		unknown	0.01	0.0097	0.0092	32	0
63.6469	848.07		unknown	0.6054	0.5874	0.5577	32	0
64.3495	850.12	N8	N8-[3]	1.8956	1.8391	1.9645	32	0
64.747	851.27	A8	ethylbenzene	1.9297	1.6843	2.1137	277.16	136.2
65.0039	852		unknown	1.3544	1.1821	1.4835	277.16	136.2
65.545	853.55		unknown	0.0422	0.0368	0.0462	277.16	136.2
65.685	853.94	N9	1c,3c,5c-trimethylcyclohexane	0.3853	0.3738	0.355	32	0

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
66.3083	855.7	O9	2-methyloctene-1	0.0905	0.1003	0.0833	32	0
67.6903	859.53		unknown	0.0703	0.078	0.0648	32	0
68.1595	860.81	A8	1,3-dimethylbenzene	2.9248	2.5611	3.2036	282.416	139.12
68.471	861.66	A8	1,4-dimethylbenzene	0.573	0.5036	0.6276	281.048	138.36
68.8632	862.71		unknown	0.1497	0.1316	0.164	281.048	138.36
69.2587	863.77	I9	2,3-dimethylheptane	0.1476	0.1538	0.1338	284.9	140.5
69.5025	864.42	I9	3,4-dimethylheptane	0.7046	0.729	0.6388	285.08	140.6
69.8614	865.38	I9	3,4 -dimethylheptane	0.4196	0.4341	0.3804	285.08	140.6
70.3981	866.79	I9	3,5-dimethylheptane	0.5327	0.5579	0.483	276.8	136
70.8442	867.95		unknown	0.0049	0.0052	0.0045	276.8	136
71.5847	869.87	I9	4-methyloctane	0.4486	0.4714	0.4068	288.392	142.44
72.042	871.05	I9	2-methyloctane	0.3162	0.3354	0.2867	289.904	143.28
72.2545	871.59		unknown	0.0838	0.0889	0.076	289.904	143.28
72.9061	873.24	N9	1c,2t,3c-trimethylcyclohexane	0.8054	0.804	0.7419	304.16	151.2
73.901	875.73		unknown	0.9793	0.9777	0.9021	304.16	151.2
74.0804	876.18	I9	3-ethylheptane	0.2322	0.2419	0.2105	289.4	143
74.7045	877.72	I9	3-methyloctane	0.6204	0.6516	0.5625	291.614	144.23
75.1569	878.83	I9	3,3-diethylpentane	0.2375	0.2371	0.2153	270.842	132.69
75.6075	879.93	I9	I9-[2]	0.1927	0.1997	0.1747	270.842	132.69
75.9962	880.87	I9	I9-[1]	0.1548	0.1604	0.1403	32	0
76.1807	881.31	N9	1c,2t,4c-trimethylcyclohexane	0.5379	0.5271	0.4955	275	135
76.625	882.37	N9	1,1,2-trimethylcyclohexane	0.1423	0.1346	0.1311	293.36	145.2
77.0019	883.27	A8	1,2-dimethylbenzene	1.279	1.0996	1.4009	291.974	144.43
77.6544	884.82	I9	I9-[3]	0.0644	0.0667	0.0584	291.974	144.43
78.2663	886.25	I9	I9-[4]	0.403	0.4177	0.3654	291.974	144.43
78.7895	887.47	N9	N9-[1]	1.3361	1.2963	1.2308	291.974	144.43
78.9559	887.85	N9	N9-[2]	1.3055	1.2666	1.2026	291.974	144.43
79.4267	888.94		unknown	0.0774	0.0751	0.0713	291.974	144.43
79.6334	889.41	N9	N9-[3]	0.7817	0.7584	0.7201	291.974	144.43
79.8794	889.98		unknown	0.0222	0.0215	0.0205	291.974	144.43
80.2098	890.73	I9	I9-1	0.0731	0.0758	0.0663	32	0

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
80.5507	891.5	I9	I9-2	0.2343	0.2429	0.2125	32	0
81.0678	892.67	N9	i-butylcyclopentane	0.2657	0.2575	0.2448	298.346	147.97
81.2122	892.99	N9	N9-[4]	0.1037	0.1006	0.0955	298.346	147.97
82.16	895.11		unknown	0.0045	0.0044	0.0042	298.346	147.97
82.5217	895.91	O9	t-nonene-2	0.1068	0.1184	0.0984	32	0
82.8028	896.52	O9	c-nonene-2	0.0433	0.048	0.0399	32	0
83.051	897.07	O9	t-7-methyloctene-3	0.0444	0.0492	0.0409	32	0
83.3201	897.66	I9	I9-[5]	0.2114	0.2191	0.1917	32	0
83.9622	899.05	O9	c-nonene-3	0.6191	0.6863	0.5703	32	0
84.3996	900	P9	n-nonane	0.204	0.2151	0.1849	303.476	150.82
84.7176	901.6	N9	1,1-methylethylcyclohexane	1.1601	1.0889	1.0686	305.924	152.18
85.2883	904.47	O9	t-nonene-3	0.1107	0.1149	0.102	32	0
85.5728	905.89	N9	N9-[5]	0.1334	0.1278	0.1229	32	0
85.9697	907.87	N9	N9-[6]	0.039	0.0374	0.036	32	0
86.2528	909.27		unknown	0.0015	0.0014	0.0014	32	0
86.6825	911.39	N9	N9-[7]	0.0321	0.0307	0.0295	32	0
87.0117	913.01	I10	I10-[1]	0.0402	0.0417	0.0329	32	0
87.3468	914.65	A9	i-propylbenzene	0.2909	0.2554	0.2815	306.338	152.41
87.618	915.97	N9	N9-[8]	1.2362	1.1842	1.1388	306.338	152.41
88.0817	918.22	N9	N9-[9]	0.0712	0.0682	0.0656	306.338	152.41
88.217	918.87	O9	c-nonene-2H16(124)	0.388	0.4301	0.3574	32	0
88.917	922.24	N9	i-propylcyclohexane	0.3254	0.307	0.2998	310.622	154.79
89.2995	924.07	I10	2,4-dimethyloctane	0.1988	0.2071	0.1625	312.62	155.9
89.5612	925.31	I10	2,2-dimethyloctane	0.1634	0.1707	0.1336	314.42	156.9
89.9683	927.24		unknown	0.0542	0.0566	0.0443	314.42	156.9
90.365	929.11		unknown	0.0224	0.0234	0.0183	314.42	156.9
90.4852	929.68	N9	N9-[10]	0.1411	0.1352	0.13	314.42	156.9
91.1184	932.64	I10	2,6-dimethyloctane	0.9855	1.025	0.8055	320.738	160.41
91.3765	933.84	I10	2,5-dimethyloctane	0.1777	0.1842	0.1453	317.3	158.5
91.6547	935.14		unknown	0.0033	0.0034	0.0027	317.3	158.5
92.0058	936.76		unknown	0.0197	0.0204	0.0161	317.3	158.5

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
92.2427	937.85	N9	n-butylcyclopentane	0.3477	0.3354	0.3203	313.916	156.62
92.5494	939.26	N10	N10-[1]	0.1372	0.1298	0.1138	313.916	156.62
92.7811	940.32	I10	I10-[2]	0.0321	0.0332	0.0262	313.916	156.62
93.0479	941.54		unknown	0.1198	0.1242	0.0979	313.916	156.62
93.4937	943.57	I10	3,3-dimethyloctane	0.7369	0.7546	0.6022	322.16	161.2
93.8408	945.14		unknown	0.4227	0.4328	0.3454	322.16	161.2
94.02	945.95		unknown	0.0375	0.0384	0.0306	322.16	161.2
94.21	946.8		unknown	0.1724	0.1765	0.1409	322.16	161.2
94.7011	949.01	A9	n-propylbenzene	0.4299	0.3774	0.4159	318.632	159.24
95.0874	950.73	I10	3,6-dimethyloctane	0.2735	0.2811	0.2235	321.44	160.8
95.5317	952.7	I10	3-methyl-5-ethylheptane	0.1018	0.1061	0.0832	316.76	158.2
95.9583	954.59		unknown	0.0025	0.0026	0.0021	316.76	158.2
96.183	955.58	N10	N10-[2]	0.1885	0.1783	0.1563	316.76	158.2
96.5069	957	A9	1,3-methylethylbenzene	0.254	0.2223	0.2457	322.394	161.33
96.8993	958.72		unknown	0.1524	0.1334	0.1475	322.394	161.33
97.0538	959.39	A9	1,4-methylethylbenzene	0.2021	0.1776	0.1955	323.618	162.01
97.3383	960.63		unknown	0.0056	0.0049	0.0054	323.618	162.01
97.58	961.68		unknown	0.0011	0.001	0.0011	323.618	162.01
97.7975	962.62	N10	N10-[3]	0.0177	0.0168	0.0147	323.618	162.01
98.0588	963.75		unknown	0.0885	0.0837	0.0734	323.618	162.01
98.1643	964.2	A9	1,3,5-trimethylbenzene	0.141	0.1233	0.1364	328.532	164.74
98.5663	965.93	I10	I10-[3]	0.0262	0.0268	0.0214	328.532	164.74
98.8008	966.93	I10	I10-[4]	0.0292	0.0298	0.0238	328.532	164.74
98.9458	967.55		unknown	0.0025	0.0026	0.0021	328.532	164.74
99.2781	968.97	N10	N10-[4]	0.0189	0.0194	0.0155	328.532	164.74
99.5019	969.92		unknown	0.0626	0.064	0.0512	328.532	164.74
99.6122	970.39	I10	5-methylnonane	0.0313	0.0324	0.0256	329.18	165.1
99.8333	971.32		unknown	0.0045	0.0047	0.0037	329.18	165.1
100.1403	972.62	A9	I17 &1,2-methylethylbenzene	0.2466	0.2119	0.2386	329.324	165.18
100.5777	974.46	I10	2-methylnonane	0.0187	0.0194	0.0152	332.654	167.03
100.906	975.83	I10	3-ethyloctane	0.0645	0.066	0.0527	331.7	166.5

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
101.1333	976.78		unknown	0.0337	0.0345	0.0275	331.7	166.5
101.2583	977.3		unknown	0.0074	0.0075	0.006	331.7	166.5
101.4906	978.27	I10	3-methylnonane	0.0691	0.0713	0.0565	334.04	167.8
101.9175	980.03		unknown	0.0011	0.0011	0.0009	334.04	167.8
102.14	980.95	N10	N10-[5]	0.0041	0.0039	0.0034	334.04	167.8
102.4061	982.05	I10	I10-[5]	0.0161	0.0165	0.0132	334.04	167.8
102.655	983.07	O10	3-ethyl-2-methylheptene-2	0.0036	0.0039	0.003	32	0
103.0033	984.5		unknown	0.0266	0.0287	0.022	32	0
103.1144	984.95	A9	1,2,4-trimethylbenzene	0.2137	0.1846	0.2067	336.884	169.38
103.4675	986.39		unknown	0.0115	0.0099	0.0111	336.884	169.38
103.585	986.87	N10	i-butylcyclohexane	0.0495	0.0471	0.0411	340.34	171.3
103.8705	988.03	I10	I10-[6]	0.0126	0.0129	0.0103	340.34	171.3
104.175	989.26	I10	I10-[7]	0.0126	0.0129	0.0103	340.34	171.3
104.2359	989.51	I11	I11-[1]	0.0078	0.008	0.0058	340.34	171.3
104.6078	991	N10	N10-[6]	0.0083	0.0078	0.0069	340.34	171.3
104.8083	991.81	O10	decene-1	0.0017	0.0017	0.0014	339.08	170.6
105.3	993.78	N10	1t-methyl-2-n-propylcyclohexane	0.0107	0.0101	0.0088	339.8	171
105.56	994.82	A10	i-butylbenzene	0.014	0.0124	0.0121	343.022	172.79
105.926	996.27	I10	I10-[1]	0.0034	0.0034	0.0027	343.022	172.79
106.125	997.06		unknown	0.0069	0.0071	0.0057	343.022	172.79
106.3194	997.83	A10	sec-butylbenzene	0.0146	0.0128	0.0127	344.012	173.34
106.5556	998.76		unknown	0.0189	0.0166	0.0164	344.012	173.34
106.8692	1000	P10	n-decane	0.0066	0.0068	0.0054	345.47	174.15
107.0122	1000.99	O10	2-decene	0.0055	0.0056	0.0045	339.08	170.6
107.3447	1003.29	N10	N10-[7]	0.0069	0.0066	0.0057	339.08	170.6
107.4767	1004.2		unknown	0.0014	0.0013	0.0011	339.08	170.6
107.6917	1005.68		unknown	0.0016	0.0016	0.0014	339.08	170.6
107.865	1006.87		unknown	0.0022	0.002	0.0018	339.08	170.6
108.1394	1008.76	A9	1,2,3-trimethylbenzene	0.0474	0.0401	0.0459	349.016	176.12
108.557	1011.62	I11	I11-[1]	0.0076	0.0078	0.0057	349.016	176.12
108.725	1012.76		unknown	0.0022	0.0022	0.0016	349.016	176.12

Minutes	Index	Group	Component	Mass %	Volume %	Mole %	BP(F)	BP(C)
109.0661	1015.08		unknown	0.0069	0.0071	0.0052	349.016	176.12
109.4317	1017.56	I11	I11-[2]	0.001	0.0011	0.0008	349.016	176.12
109.6222	1018.85		unknown	0.0011	0.0011	0.0008	349.016	176.12
109.805	1020.08		unknown	0.0024	0.0024	0.0018	349.016	176.12
110.085	1021.97	A10	2-3-dihydroindene	0.01	0.0079	0.0098	352.13	177.85
110.3967	1024.06	N10	sec-butylcyclohexane	0.0044	0.0041	0.0037	354.812	179.34
110.785	1026.66		unknown	0.0011	0.001	0.0009	354.812	179.34
110.9783	1027.95	I11	I30-[1]	0.0064	0.0066	0.0048	32	0
111.2583	1029.82		unknown	0.0021	0.0022	0.0016	32	0
111.5087	1031.48	I11	I11-[3]	0.0005	0.0005	0.0004	32	0
111.7242	1032.91	I11	3-ethylnonane	0.0049	0.005	0.0037	32	0
111.9627	1034.49		unknown	0.0017	0.0017	0.0013	32	0
112.4383			I11-[4]	0.0038	0.0039	0.0028	32	0
113.0917	1041.91	A10	1,3-diethylbenzene-[1]	0.0016	0.0014	0.0014	362.822	183.79
113.51	1044.64	A10	1,3-methyl-n-propylbenzene	0.0027	0.0024	0.0024	359.618	182.01
113.7217	1046.01	I11	I11-[5]	0.0008	0.0007	0.0006	359.618	182.01
114.0761	1048.31	A10	1,4-methyl-n-propylbenzene	0.0014	0.0012	0.0012	362.156	183.42
114.2528	1049.46	A10	n-butylbenzene	0.002	0.0017	0.0017	361.94	183.3
114.5807	1051.57	A10	1,3-dimethyl-5-ethylbenzene	0.0009	0.0008	0.0008	362.516	183.62
114.9657	1054.05	A10	1,2-diethylbenzene	0.0012	0.001	0.001	362.228	183.46
115.8489	1059.7	A10	1,2-methyl-n-propylbenzene	0.0008	0.0007	0.0007	364.946	184.97
117.425	1069.67	A10	1,4,dimethyl-2-ethylbenzene	0.0004	0.0004	0.0004	368.366	186.87
117.71	1071.46	A10	1,3-dimethyl-4-ethylbenzene	0.0006	0.0005	0.0005	370.832	188.24
118.5033	1076.41	A10	1,2-dimethyl-4-ethylbenzene	0.0005	0.0004	0.0004	373.136	189.52
119.5377	1082.82	A10	1,3-dimethyl-2-ethylbenzene	0.0006	0.0005	0.0006	374.09	190.05