



Marine Bulk Oil Surveyors
Independent sworn chemists
Chemical Laboratories

SAYBOLT-VAN DUYN BV

Members A.S.T.M.

Management H. F. Pluimers - Ir F. Pluimers

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Our ref. FP/cg

Your ref.

3000 AD Rotterdam, February 14, 1979
P.O. Box 151

REPORT NR. 10688/79

TRUE BOILING POINT DISTILLATION

Sample : Crude Oil
Description on label : Statoil Base Dusavik Stavanger
20 liters, properly packed in a steel container.
Received in our lab. : January 10, 1979
Date of testing : January 16, 1979 and following
Analist : J.Pelis/J. Haddeman

I Distillation equipment : ASTM - CEN D 2892/TC 19N 501E
Barometric pressure : 1037 mBar
Roomtemperature : 23°C
Vacuumdistillation :
at 100 mm Hg from 205 °C to 300 °C
at 20 mm Hg from 300 °C to 350 °C
at 10 mm Hg from 350 °C to 385 °C
at 1 mm Hg from 385 °C to 538 °C

Remarks:

The atmospheric cutting points have been corrected to 760 mm Hg (or 1013 mBar)

Statoil A.S.
STAVANGER

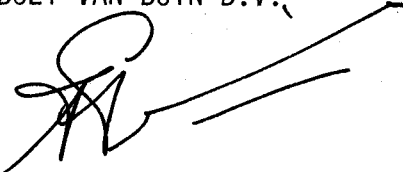
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High vacuum distillation has been performed in a separate low efficiency still.

To little sample was available in the light fractions for proper determination of the octane values.

SAYBOLT-VAN DUYN B.V.,



II Characteristics of the whole crude oil

Spec. Gravity at 15/4 °C	0.8800
A.P.I. Gravity at 60 °F	29.22
Water content by distillation	traces vol%
Kinematic Viscosity at 40 °C	8.75 cS
Pourpoint	- 27 °C
Sulphur (X-ray)	0.42 wt%
Salt content (conductivity)	1.14 mg/l
Total acid number	0.4 mg KOH/gr.
Nickel	1.2 ppm
Vanadium	1.0 ppm
Distillation ASTM D 86	
5 vol%	121 °C
10 vol%	146 °C
20 vol%	201 °C
30 vol%	255 °C
40 vol%	288 °C
50 vol%	334 °C
60 vol%	351 °C
70 vol%	360 °C
Conradson carbon residue	1.9 wt%

III Light ends (by gaschromatography)

C1	methane	traces wt%
C2	ethane	0.10 wt%
C3	propane	0.14 wt%
i-C4	iso butane	0.17 wt%
n-C4	normal butane	0.18 wt%
i-C5	iso pentane	0.35 wt%
n-C5	normal pentane	0.17 wt%
	cyclo pentane	<u>0.10</u> wt%
	total	1.21 wt%

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IV T.B.P. Distillation Data

fraction oC	yield on crude		Spec. Grav. 15/40C	yield on crude		° API
	wt%	cum.wt%		vol%	cum.vol%	
Gas	0.40	--	0.5570	0.64	--	122.59
Loss	0.16	0.56	--	0.14	0.78	--
IBP - 60	0.94	1.50	0.6460	1.28	2.06	87.51
60 - 75	0.67	2.17	0.7075	0.83	2.89	68.44
75 - 90	0.94	3.11	0.7351	1.13	4.02	60.94
90 - 105	1.86	4.97	0.7515	2.17	6.19	56.72
105 - 120	1.74	6.71	0.7639	2.00	8.19	53.66
120 - 135	2.00	8.71	0.7776	2.26	10.45	50.40
135 - 155	2.82	11.53	0.7922	3.13	13.58	47.05
155 - 165	1.63	13.16	0.8004	1.79	15.37	45.20
165 - 175	1.52	14.68	0.8061	1.66	17.03	43.95
175 - 190	2.01	16.69	0.8113	2.18	19.21	42.83
190 - 205	2.24	18.93	0.8236	2.39	21.60	40.22
205 - 220	2.32	21.25	0.8357	2.44	24.04	37.74
220 - 235	2.99	24.24	0.8436	3.12	27.16	36.15
235 - 245	1.89	26.13	0.8516	1.95	29.11	34.58
245 - 270	5.54	31.67	0.8646	5.64	34.75	32.06
270 - 285	3.19	34.86	0.8745	3.21	37.96	30.21
285 - 300	3.25	38.11	0.8713	3.28	41.24	30.81
300 - 320	3.92	42.03	0.8746	3.94	45.18	30.20
320 - 335	3.60	45.63	0.8814	3.59	48.77	28.95
335 - 350	3.40	49.03	0.8924	3.35	52.12	26.97
350 - 360	1.65	50.68	0.9025	1.61	53.73	25.20
360 - 375	2.74	53.42	0.8980	2.69	56.42	25.98
375 - 385	2.44	55.86	0.9000	2.39	58.81	25.63
385 plus	44.14	100.00	0.9431	41.19	100.00	18.46
385 - 538	26.19		0.9210	25.02		22.08
538 plus	17.95	44.14	0.9765	16.17	41.19	13.36

Fractions oC	IBP - 60	60 - 90	90 - 155	155 - 175	175 - 245	245 - 320	320 - 360	360 - 385	385 plus
Yield on crude oil wt%	0.94	1.61	8.42	3.15	11.45	15.90	8.65	5.18	44.14
Yield on crude oil vol%	1.28	1.96	9.56	3.45	12.08	16.07	8.55	5.08	41.19
Specific Gravity at 15/4 oC	0.6460	0.7240	0.7736	0.8035	0.8343	0.8712	0.8901	0.8989	0.9431
Specific Gravity at 70/4 oC									0.9080
A.P.I. Gravity at 60 oF	87.47	63.86	51.33	44.52	37.96	30.84	27.40	25.84	18.45
ASTM Distillation IBP oC	22	55	99	151	180	251	319	351	
5% oC	29	68	108	155	196	263	322	353	
10% oC	31	70	110	156	198	265	325	355	
30% oC	37	74	115	158	201	269	328	358	
50% oC	43	77	120	161	209	274	330	360	
70% oC	50	80	127	163	215	282	333	362	
90% oC	62	85	136	167	226	294	339	366	
Endpoint oC	68	91	153	173	241	311	352	371	
Kin. Viscosity at 40oC cS					1.43	3.43	8.66	16.33	
Kin. Viscosity at 50oC cS									360.0
Kin. Viscosity at 100oC cS									30.75
Mercaptans (as S) ppm	2	4	4	6					
Sulphur (ppm) wt%	(<10)	(<10)	(25)	(110)	(370)	0.16	0.43	0.48	0.75
Pourpoint (ASTM max) oC						< -30	< -30	-3	+3
Cloudpoint oC					< -30	< -30	-13	-3	
Reid Vapour Pressure psi	> 20	5.6	1.4	0.2					
R.O.N.	--	--	69.3	61.3					
R.O.N. + 0.4 gr/l TEL	--	--	--	--					

V b

Fraction	oC	IBP - 60	60 - 90	90 - 155	155 - 175	175 - 245	245 - 320	320 - 360	360 - 385	385 plus
Paraffins	wt%	83.6	41.4	39.5	--					
Naphtenes	wt%	15.1	55.8	44.2	--					
Aromatics	(vol%)wt%	1.3	2.8	15.7	--	(30.4)				
Propane	C3 wt%	0.1	0.04							
i-Butane	i-C4 wt%	3.6	0.3							
n-Butane	n-C4 wt%	7.5	0.6							
i-Pentane	i-C5 wt%	29.0	2.3							
n-Pentane	n-C5 wt%	14.4	1.5							
Cyclopentane	wt%	7.3	1.6							
Total Nitrogen	wt%						0.01	0.01	0.01	
Smoke point	mm			25	21	18				
Freezing point	oC			< -60	< -60	< -60				
Aniline point	oC									
Cetane index D 893						37.5	42.7	48.9	52.5	
Flashpoint AP	oC					66				
Conradson Carbon Res.	wt%									4.8
Vanadium	ppm									2.4
Nickel	ppm									2.5
Sodium	ppm									0.1
Aromatics	wt%									
Penetration at 25 oC	mm									
Softening point R&B	oC									
Naphtalenes	vol%					1.73				

VI CHARACTERISTICS OF VACUUM GASOIL 385 - 538^oC fraction

Yield	26.19	wt%
	25.02	vol%
Spec. Gravity at 15/4 ^o C	0.9210	
Vacuum distillation D 1160		
5 vol%	395	oC
10 vol%	405	oC
20 vol%	420	oC
30 vol%	432	oC
40 vol%	441	oC
50 vol%	454	oC
60 vol%	467	oC
70 vol%	487	oC
80 vol%	506	oC
90 vol%	525	oC
95 vol%	530	oC
FBP	535	oC
Sulphur	0.55	wt%
Pourpoint (ASTM max.)	60	oF
Kin. viscosity at 50 ^o C	51.8	cst
Kin. viscosity at 100 ^o C	8.8	cst
Conradson Carbon Residue	0.15	wt%
Nickel	2.1	ppm
Vanadium	1.8	ppm
Nitrogen	0.125	wt%
Aromatics (IR)	19.6	wt%

VII CHARACTERISTICS OF VACUUM RESIDUE 538⁰C plus fraction

Yield	17.95	wt%
Yield	16.17	vol%
Spec. Gravity at 15/4 ⁰ C	0.9765	
Pourpoint	80	oF
Kin. viscosity at 50 ⁰ C	5848	cst
Kin. viscosity at 100 ⁰ C	187	cst
Sulphur	0.96	wt%
Conradson Carbon Residue	11.0	wt%
Nickel	5.0	ppm
Vanadium	4.0	ppm
Softening point R & B	21	oC
Penetration at 4 ⁰ C 100 gr/5sec	168	mm

