

1/12

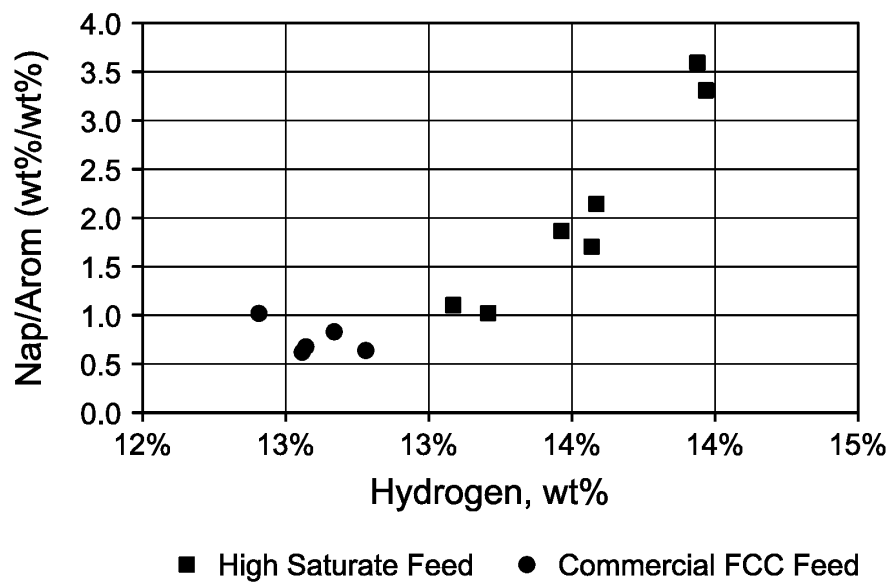


FIG. 1

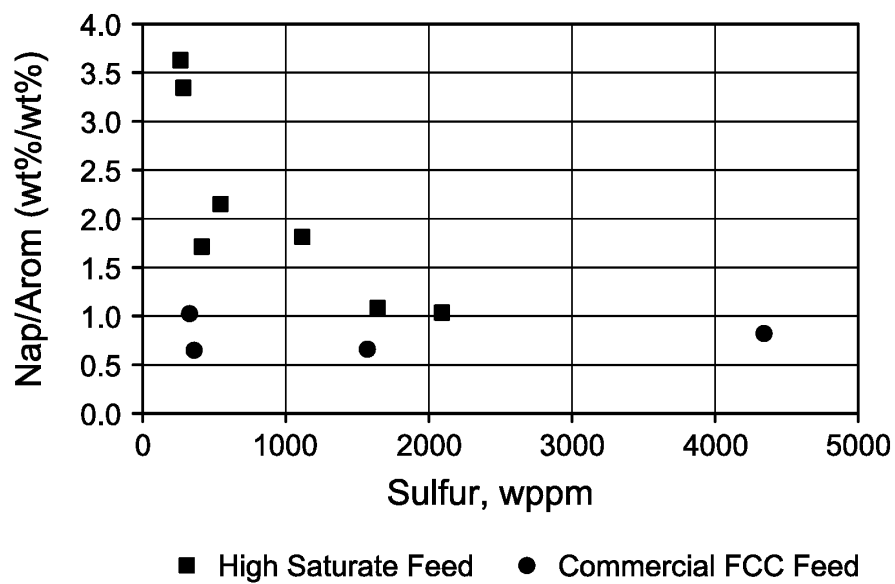


FIG. 2

2/12

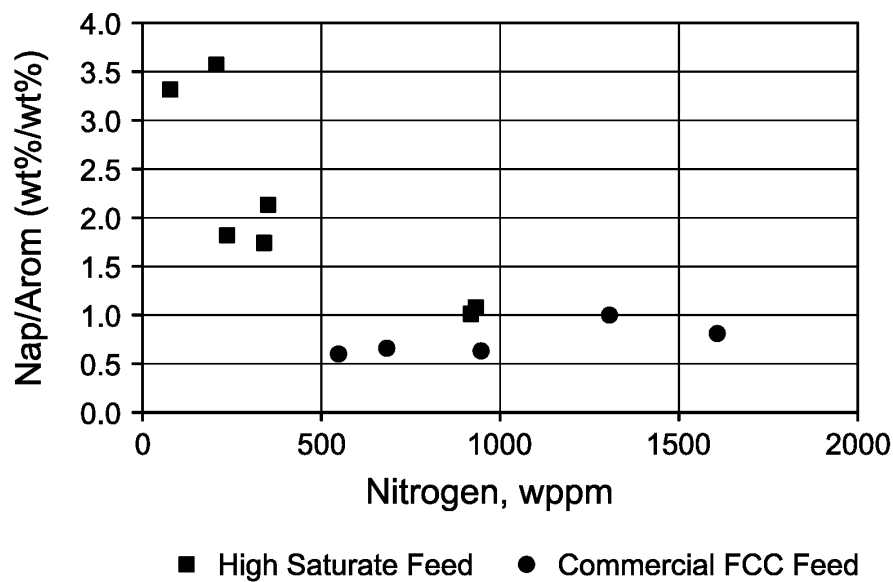


FIG. 3

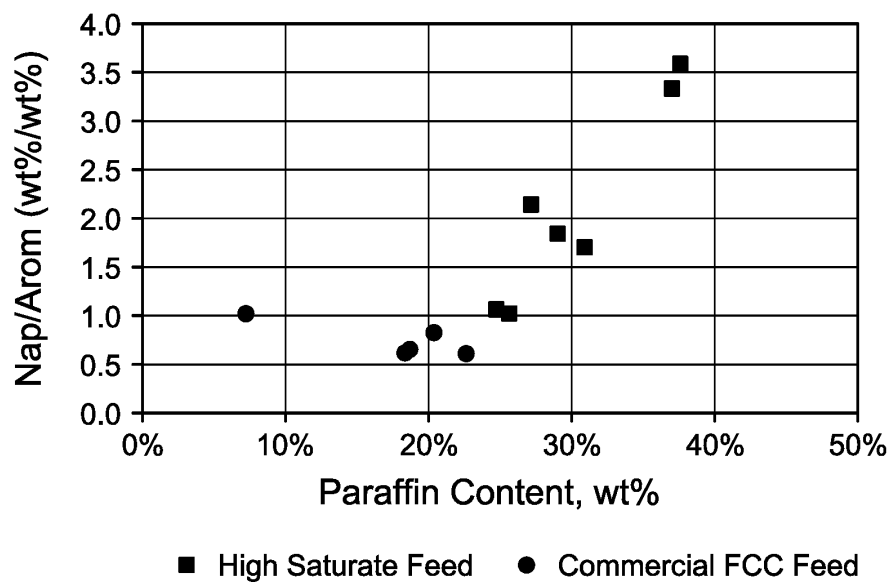


FIG. 4

3/12

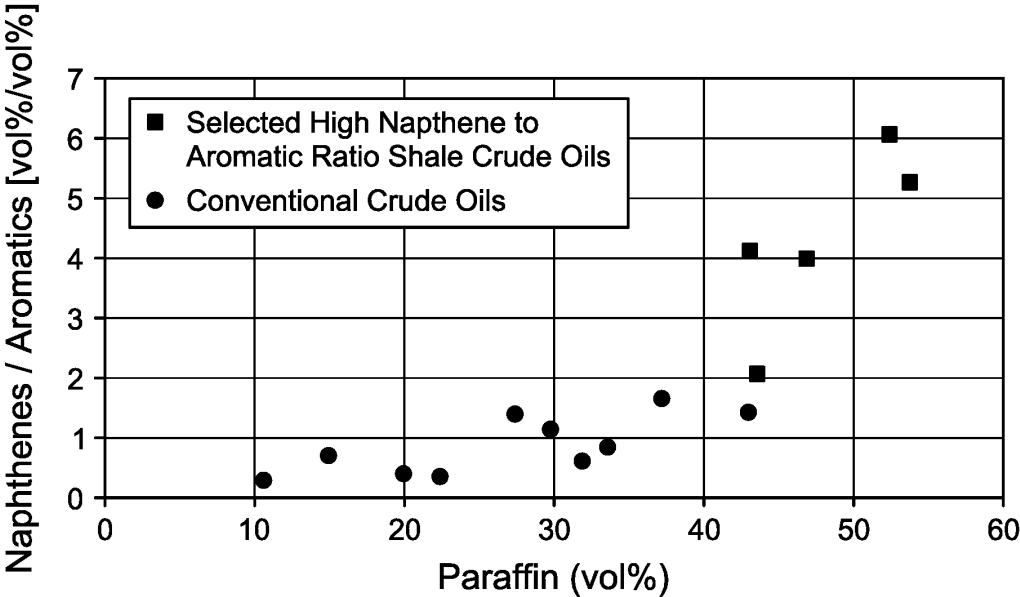
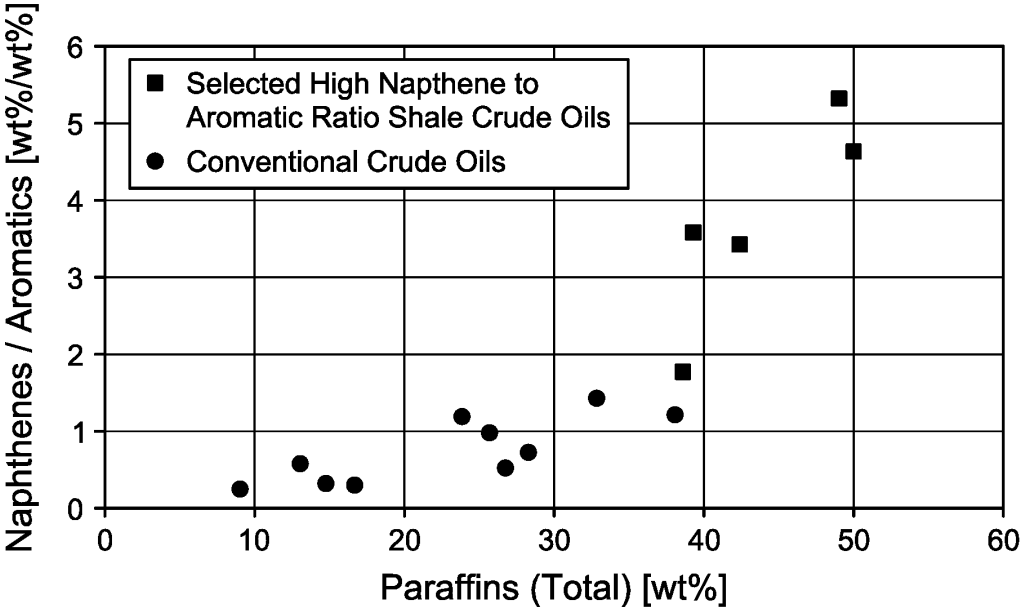


FIG. 5

4/12

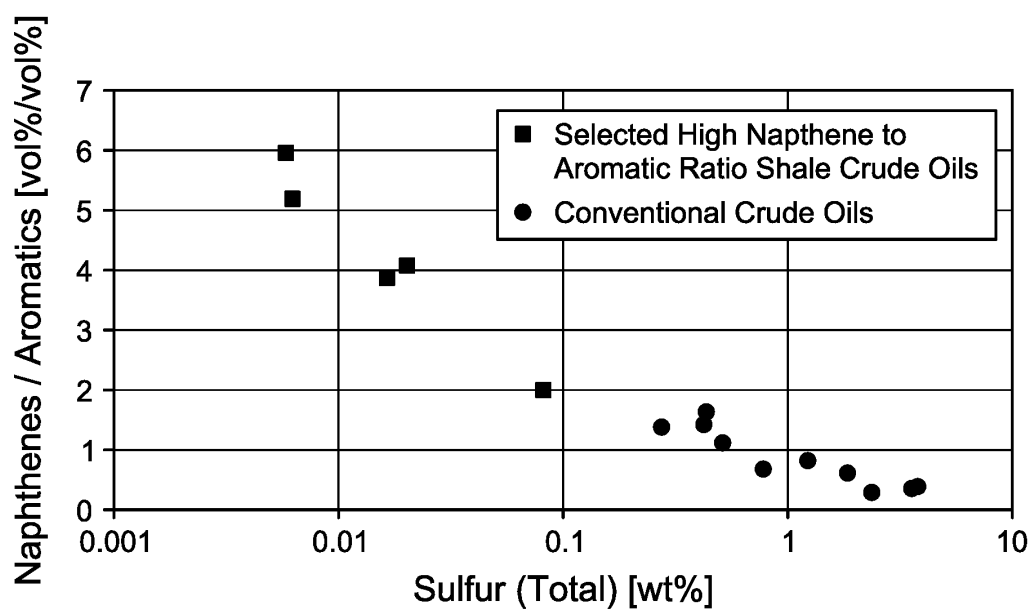
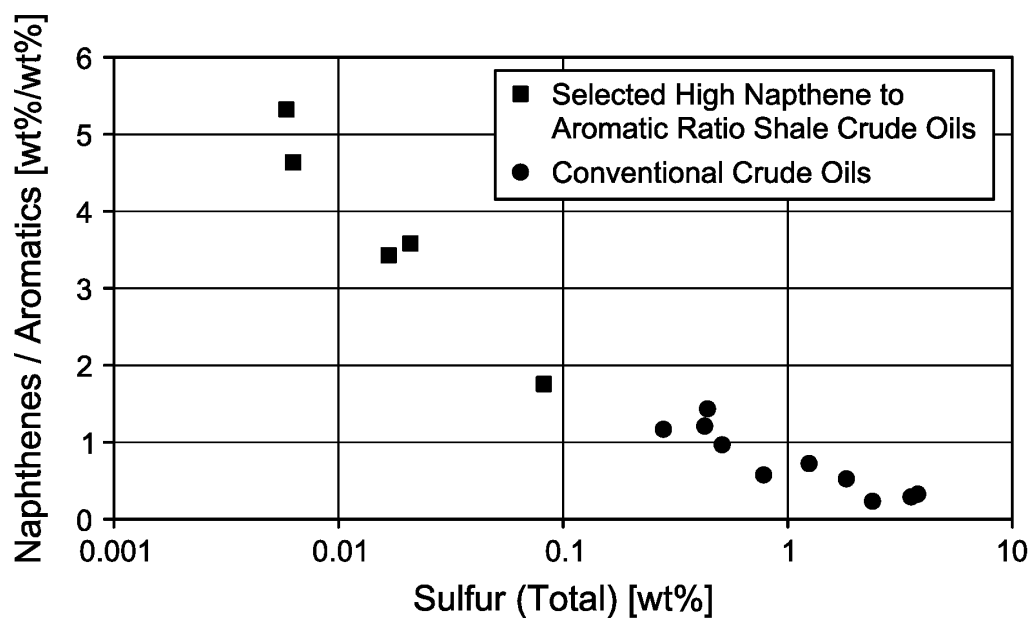


FIG. 6

5/12

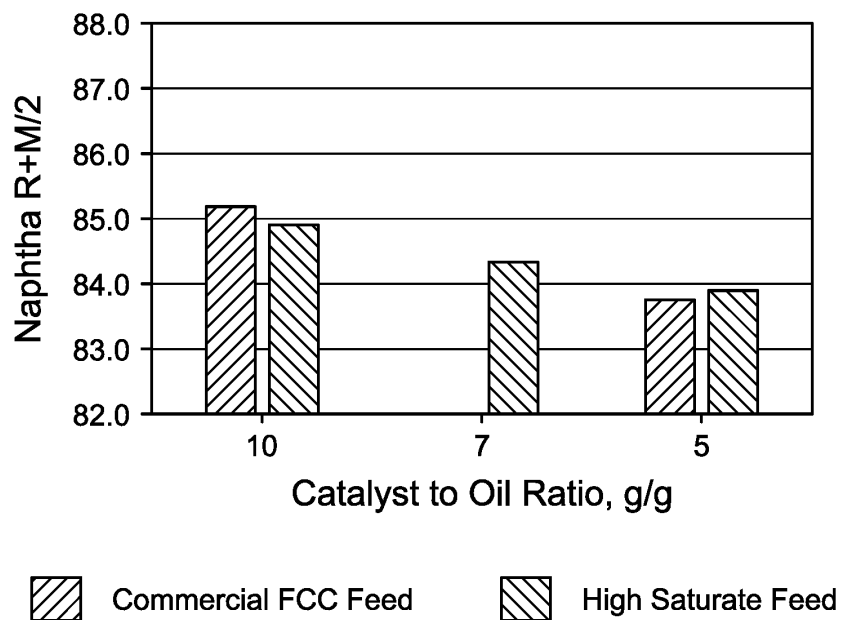


FIG. 7

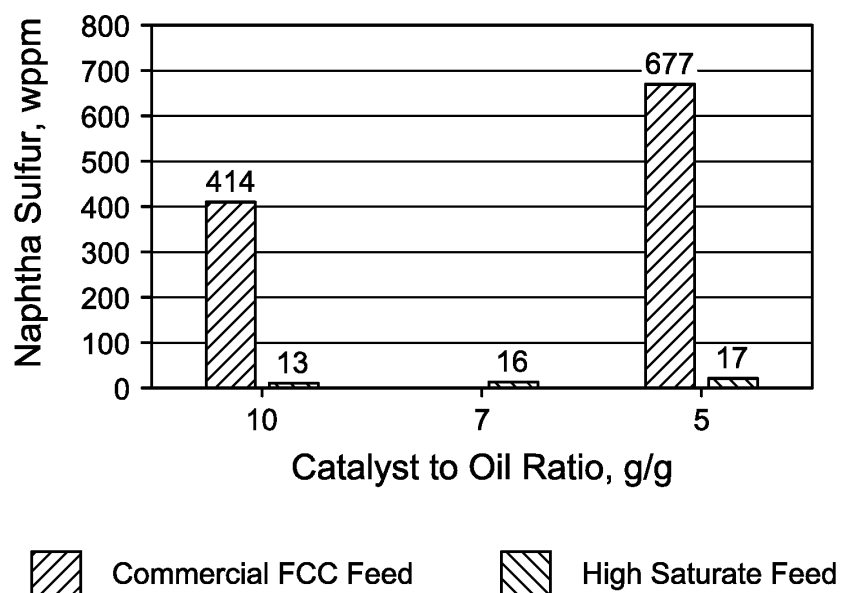


FIG. 8

6/12

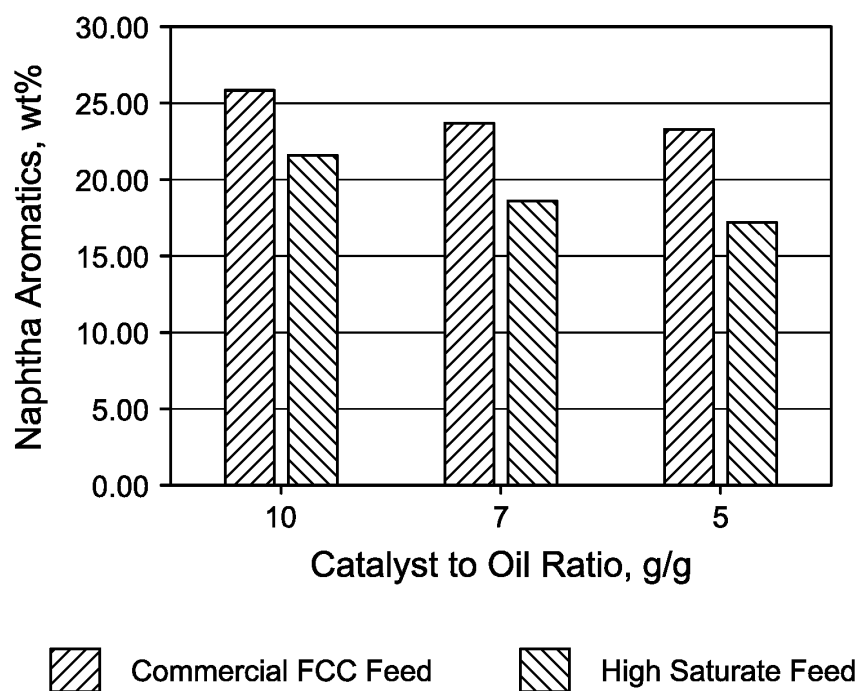


FIG. 9

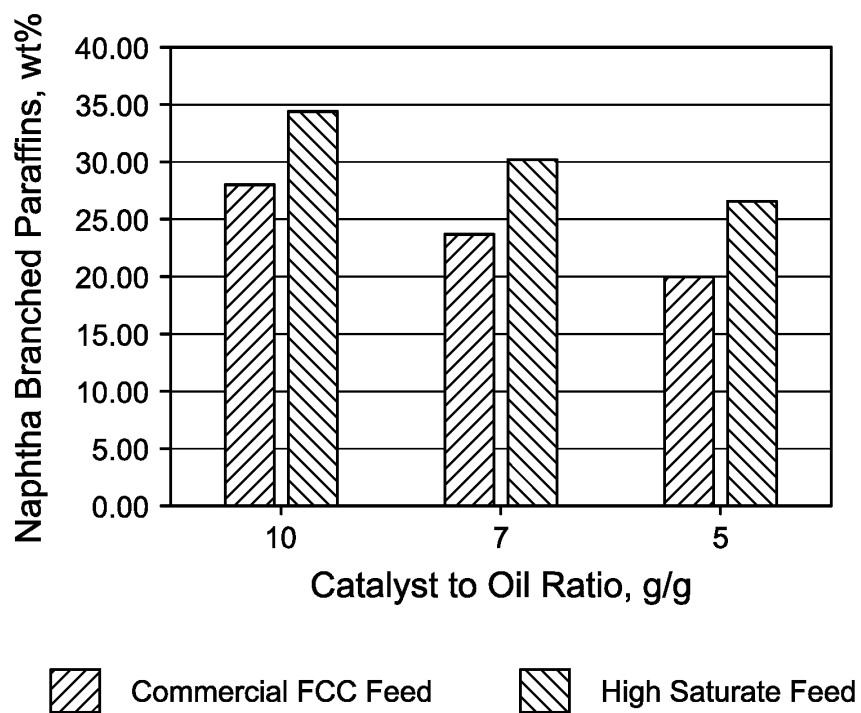


FIG. 10

7/12

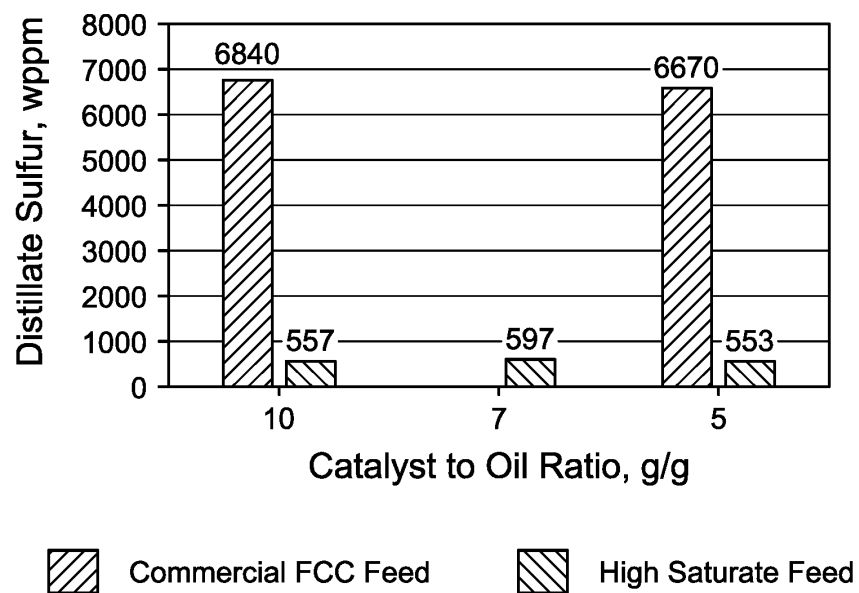


FIG. 11

8/12

Distillate (430-650°F)	A	B	C	D	ECA ISO8217 DMA
Total Naphthenes wt% (less olefins)	8.8	7.2	16.5	10.2	
Total Saturates wt% (Paraffins plus naphthenes less olefins)	26.4	24.5	35.9	34.8	
Total Cyclics wt% (Aromatics plus naphthenes less olefins)	79.1	82.8	70.6	65.5	
Napthenes/Aromatics, wt/wt	0.125	0.095	0.305	0.184	
Paraffins/Aromatics wt/wt	0.250	0.229	0.359	0.445	
Saturates/Aromatics wt/wt	0.376	0.324	0.664	0.629	
Paraffins/Saturates wt/wt	0.667	0.706	0.540	0.707	
Paraffins/Cyclics wt/wt	0.223	0.209	0.275	0.376	
Oxidation Induction: Time to Pressure Drop, min	625	184	746	115	
Total Acid Number, mgKOH/g	0.12	0.26	0.00	0.04	≤0.5
Max Acid Number, mgKOH/g	0.12	0.03	<0.01	<0.01	
Kinematic Viscosity (40 °C) mm ² /s	2.397	2.569	3.274	3.018	2 - 6
Cloud Point, °C	-22	-27	-17	-12	Report
Pour Point, °C	-27	-38	-17	-13	
Cold Filter Plugging Point, °C	-22	-24	-15	-11	Report
Cetane Index (ASTM D976)	33.5	26.6	37.6	38.4	
Cetane Index Delta After Hydrotreating (ASTM D976), Modeled	+6.1		+5.8		
Cetane Index (ASTM D4737 Procedure A)	32.6	26.5	37.0	40.7	≥40
Cetane Index Delta After Hydrotreating (ASTM D4737), Modeled	+6.4		+6.8		
Cetane Index (ASTM D4737 Procedure B)	29.3	18.9	35.1	38.2	
Corrosion of Cu by Petroleum, 150°C, 3 Hrs	1B	1B	2C	2B	
Density (15.6C), kg/m ³	917	926	895	883	≤890
Distillate Fuel Net Specific Energy (MJ/kg) (correlation)	41.7	42.0	41.8	42.3	
Volumetric heating value (MJ/L) (correlation)	38.3	37.6	38.7	37.4	
Wax Endpoint Temp, °C (Based on DSC)	-12	-13	-6	0	
Meets Tested ISO8217 DMA Limits* <i>*Not the complete spec</i>	No	No	No	Yes	

A and C: Conventional Feed**B and D:** High Saturates / Low Heteroatom Feed**A and B:** High Severity (C/O ratio ~10.5) **C and D:** Low Severity (C/O ratio ~ 5.0)**FIG. 12**

SUBSTITUTE SHEET (RULE 26)

9/12

Feed Description	Commercial FCC Feed	High Saturate Feed	Commercial FCC Feed	High Saturate Feed
RTT, °F	980	980	980	980
C/O, g/g	10.7	10.3	5.1	4.9
Bottoms (650°F-FBP)				
Density, g/cc	1.063	1.013	0.938	0.904
HDT Density, g/cc				
Total Sulfur, wt%	1.620	0.204	0.925	0.107
Aliphatic Sulfur, wppm	-	0.065	0.082	0.058
Aliphatic Sulfur to Total Sulfur Ratio, wt/wt	-	0.32	0.09	0.54
HDT Aliphatic Sulfur to Total Sulfur Ratio, wt/wt	<0.001	-	<0.001	-
Nitrogen, wppm	2536	518	1791	346
Hydrogen, wt%	8.09	9.46	11.19	12.19
M1567, wt% (°F)				
5	648	662	650	653
10	666	676	669	671
50	753	757	760	744
90	873	877	881	877
95	914	915	924	917
Olefins, wt%	None detected by NMR	None detected by NMR	None detected by NMR	None detected by NMR
Kinematic Viscosity by Stabinger, mm ² /s				
KV (40°C)		197.810		27.210
KV (60°C)	51.085		14.696	
KV (100°C)	9.078	9.334	5.017	4.527
KV (50°C) (Calculated)	96.27	94.77	21.18	18.15
MCRT, wt%	3.36		1.00	0.58
n-C7 Insolubles, wt%	0.58	0.42	2.40	0.28
STAR7, wt%				
Saturates	15.1	27.3	38.6	54.8
Aromatics	81.5	72.70	61.40	45.20
ARC1	0.9	0.9	3.4	1.0
ARC2	4.8	3.3	5.2	1.9
ARC3	33.9	30.2	16.2	12.7
ARC4	41.9	36.0	34.9	26.7
Saturates/Aromatics	0.185	0.376	0.629	1.212

FIG. 13

10/12

Feed Description	Commercial FCC Feed	High Saturate Feed	Commercial FCC Feed	High Saturate Feed
RTT, degF	980	980	980	980
C/O, g/g	10.7	10.3	5.1	4.9
Bottoms (650°F-FBP)				
SBN			96	85
CCAI	942.6	887.6	839.9	806.9
BMCI [SBN Surrogate](Used BP and density)	119.4	95.7	59.7	44.8
BMCI to Total Sulfur Ratio	73.7	469.1	64.5	418.7
HDT BMCI [SBN Surrogate](Used BP and density)	76.6	-	34.0	-
Density (15°C), kg/m ³	1063	1013	938	904
Residual Fuel Net Specific Energy (MJ/kg) (correlation)	39.6	40.8	41.6	42.3
Volumetric heating value (MJ/L) (correlation)	42.1	41.3	39.0	38.2
No Flow Point, °C	20.5	-6.4	34.3	18.2
Wax Endpoint Temp, °C (Based on DSC)	75	70	60	77
Meets Tested ISO8217 RME 180 Limits*	No	No	No	Yes
<i>*Not the complete spec</i>	No	No	No	Yes

FIG. 14

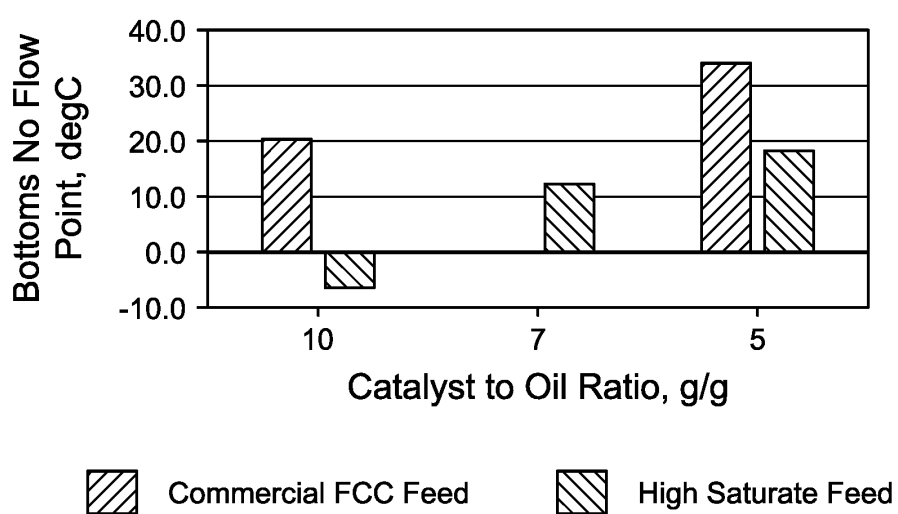


FIG. 15

11/12

FEED DESCRIPTION	Commercial FCC Feed	High Saturate Feed	Commercial FCC Feed	High Saturate Feed
TEMPERATURE, °F	980	980	980	980
C/O, g/g	10.7	10.3	5.1	4.9
430°F+ CONVERSION, wt%	73.6	88.8	54.6	79.4
NORMALIZED YIELDS, WT% ON FEED				
Gasoline (C ₅ -430°F)	52.2	64.8	40.7	61.7
Coke yield	5.92	3.13	3.31	1.61
LCO (430-650°F)	17.92	8.28	23.00	11.13
LPG (C ₃ , C ₄)	13.63	19.75	8.77	15.02
Dry gases (H ₂ +C ₁ +C ₂ +H ₂ S)	1.85	1.10	1.79	1.04
Dry gases (H ₂ +C ₁ +C ₂)	1.53	1.10	1.51	1.04
Total C ₂ 's	0.81	0.63	0.85	0.62
Total C ₃ 's	4.44	6.04	3.08	4.54
Total C ₄ 's	9.19	13.71	5.70	10.48
C ₄ = / Total C ₄ 's	0.62	0.62	0.69	0.68
C ₃ = / Total C ₃ 's	0.83	0.85	0.82	0.86
C ₂ = / Total C ₂ 's	0.51	0.57	0.50	0.55
H ₂	0.16	0.09	0.13	0.07
H ₂ S	0.32	0.00	0.28	0.00
CH ₄	0.55	0.38	0.53	0.35
C ₂	0.39	0.27	0.42	0.27
C ₂ =	0.42	0.36	0.43	0.34
C ₃	0.77	0.90	0.56	0.66
C ₃ =	3.68	5.14	2.51	3.88
iC ₄	2.83	4.37	1.38	2.70
nC ₄	0.67	0.91	0.39	0.61
iC ₄ =	1.26	1.89	1.03	1.84
nC ₄ =	4.42	6.55	2.90	5.34
C ₄ =	5.68	8.44	3.93	7.18
Bottoms (650°F+)	8.5	2.9	22.4	9.5

FIG. 16

12/12

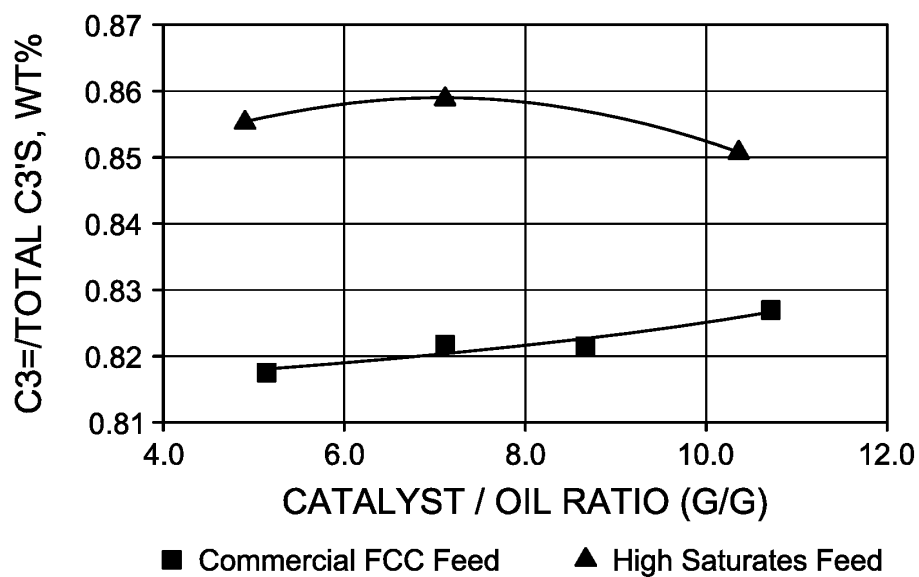


FIG. 17

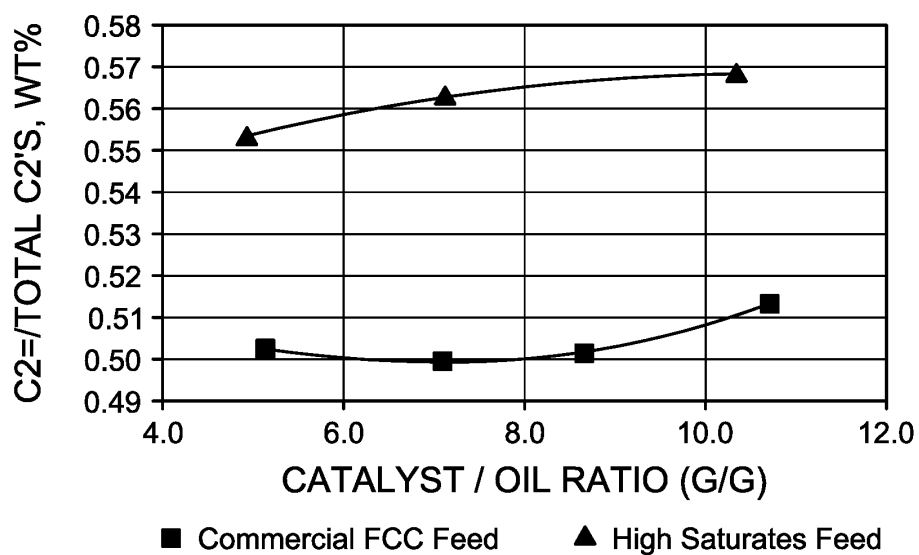


FIG. 18