

**TODAY IN THE MARKETS**

**Propylene:** RGP's implied alkylate value rose nearly 1.2 cpp to 42.375 cpp on Friday. No new propylene trades were seen. RGP bids and offers were again elusive. May PGP was offered at 30.75 cpp, basis MtB-EPC.

**Benzene:** May benzene was unchanged at 202 cpg. There was one sale: Jun at 204 cpg DDP HTC. During the day May was neither bid nor offered; Jun was 202-204 cpg DDP HTC, Jul was 207-211 cpg DDP HTC and Aug was 210-214 cpg DDP HTC.

**Aromatics:** A June styrene deal with a small volume was done this week at \$1050/mt (47.63 cpp) FOB USG. Prompt values were lower at \$995/mt (45.13 cpp) Friday on softer regional markets. The implied cumene value was unchanged at 27.6 cpp. May toluene was flat at 190 cpg; its blend value rose 0.4 cpg to 201.2 cpg (calculation based on CBOB). Mixed xylenes were flat at 206 cpg; its blend value was flat at 212.9 cpg.

**Global benzene:** Asia and Europe softened as markets remained thin. Prompt-month values were both down \$5/mt to \$628/mt (210 cpg) FOB Korea and \$655/mt (219 cpg) CIF ARA.

**Operations:** Dow was still working at restarting its PDH unit in Freeport. Marathon's 80,000 b/d Texas City refinery shut down late Thursday after a power outage. All units were being restarted on back-up generators as of Friday morning. Philadelphia Energy Solutions shut down a reformer at its 335,000 b/d Philadelphia refinery on Friday for a 10-day turnaround. Later Friday morning, a fire broke out at the refinery's heating unit, which was put out about an hour later. In Asia, New Solar started up its new 300,000 mt/yr styrene unit 2 in Changzhou on Friday.

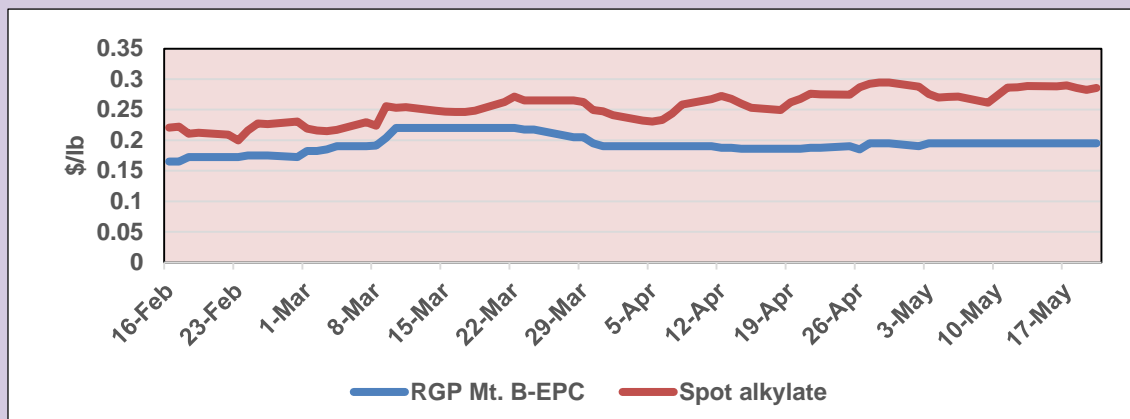
**DONE DEALS**

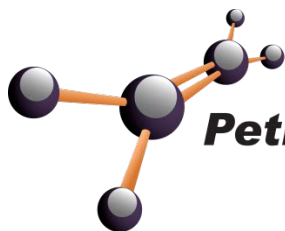
	20-May	19-May	18-May
<b>RGP MtB</b>		Jun .19* Jun. 19*	
<b>PGP TX-Other</b>		Jun .30375	May .30 May .305
<b>Benzene DDP HTC</b>	Jun 204	Jun 204	May 203 Jun 205
<b>Toluene FOB USG</b>			
<b>MX FOB USG</b>			
<b>Styrene FOB USG</b>			Jun 1050/mt (47.63 cpp)

\*Not confirmed pipeline

**CLOSING SPOT PRICES**

	Price	Change	30-day avg	MTD avg
<b>RGP implied alkylate value \$/lb</b>	0.42375	0.01174	0.40564	0.39608
<b>RG Propylene \$/lb</b>	0.19500	0.00000	0.19369	0.19467
<b>PG Propylene \$/lb</b>	0.30000	0.00000	0.30315	0.30192
<b>Alkylate \$/lb</b>	0.28551	0.00283	0.28179	0.28004
<b>Benzene \$/gal</b>	2.02000	0.00000	2.02167	2.00133
<b>Toluene \$/gal</b>	1.90000	0.00000	1.95810	1.94133
<b>Mixed xylenes \$/gal</b>	2.06000	0.00000	2.06190	2.05333
<b>Styrene \$/lb</b>	0.45130	-0.00230	0.45724	0.45571
<b>Implied cumene \$/lb</b>	0.27647	0.00000	0.27614	0.27468
<b>NYMEX WTI \$/bbl</b>	47.75	-0.41	45.54	45.90
<b>ICE Brent \$/bbl</b>	48.72	-0.09	46.76	46.88
<b>RBOB \$/gal</b>	1.63560	0.00170	1.56070	1.55915
<b>Butane \$/gal</b>	0.66750	-0.02000	0.63595	0.64825
<b>Isobutane \$/gal</b>	0.67500	-0.01500	0.64083	0.65442
<b>Natural gasoline \$/gal</b>	1.01000	0.00000	0.95863	0.95692
<b>Ethylene \$/lb</b>	0.25000	-0.00250	0.25274	0.25283





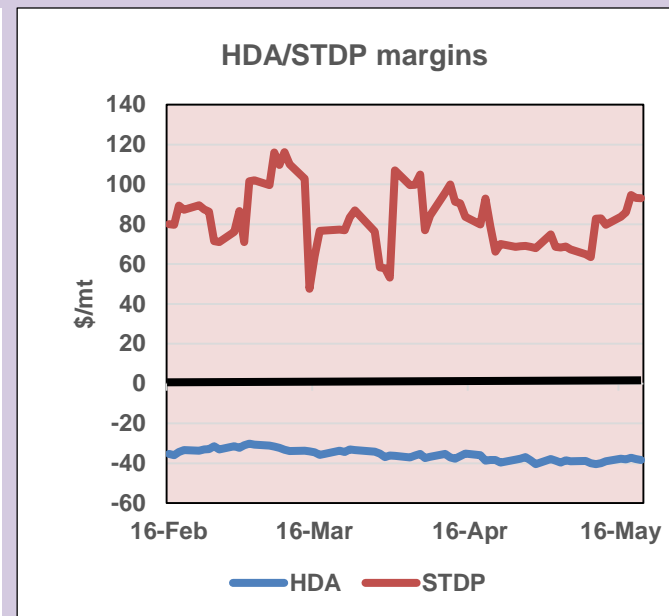
## BTX FORWARD CURVES

	Benzene	Toluene	MX
May-16	2.02000	1.90000	2.06000
Jun-16	2.04000	1.92000	2.08000
Jul-16	2.08000	1.92000	2.08000
Aug-16	2.12000	1.90500	2.06500
Sep-16	2.15000	1.88500	2.04500
Oct-16	2.18000	1.85500	2.01500
Nov-16	2.21000	1.71500	1.87500
Dec-16	2.24000	1.71000	1.87000
Jan-17	2.27000	1.69500	1.85500
Feb-17	2.30000	1.70000	1.86000
Mar-17	2.33000	1.72000	1.88000
Apr-17	2.36000	1.75000	1.91000
May-17	2.39000	1.96000	2.12000
Jun-17	2.42000	1.97000	2.13000
Jul-17	2.45000	1.97000	2.13000
Aug-17	2.48000	1.98500	2.14500
Sep-17	2.51000	1.98500	2.14500
Oct-17	2.54000	1.98000	2.14000
Nov-17	2.57000	1.84000	2.00000
Dec-17	2.60000	1.81000	1.97000
Jan-18	2.63000	1.80000	1.96000
Feb-18	2.66000	1.83000	1.99000
Mar-18	2.69000	1.86000	2.02000
Apr-18	2.72000	1.89000	2.05000
May-18	2.75000	1.92000	2.08000

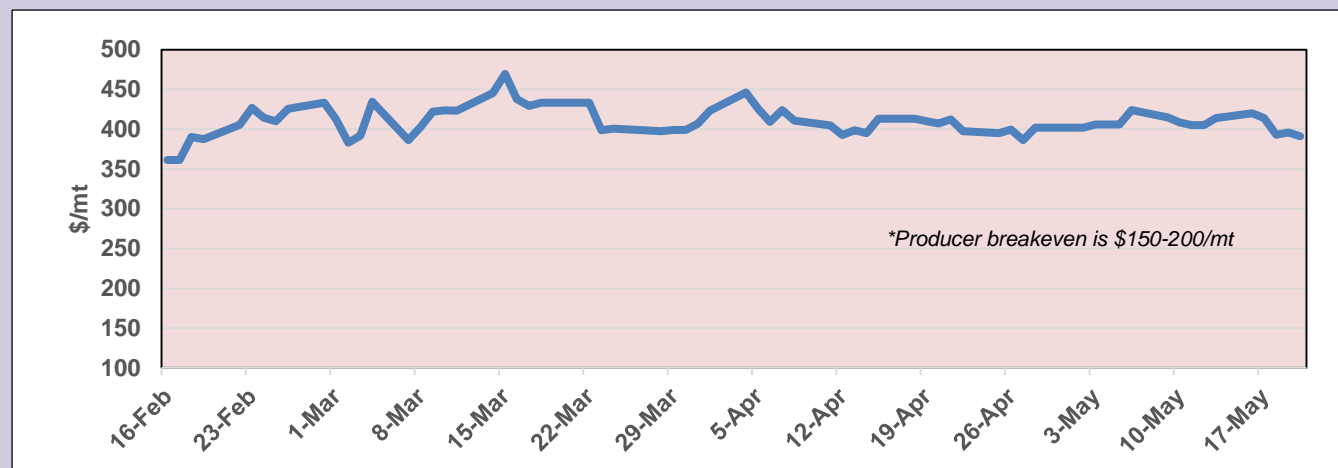
Benzene prices are basis DDP HTC. Toluene and MX prices are basis FOB USG.

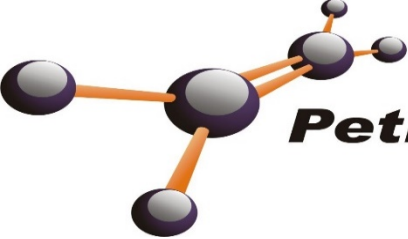
## BENZENE ECONOMICS

Benzene spread to:	\$/gal	Change	\$/mt
Styrene	1.31	-0.02	390.96
Toluene	0.12	0.00	26.95
N+A naphtha	0.83	-0.02	184.28
RBOB gasoline	0.38	0.00	11.89
<b>Benzene ratio to:</b>			
WTI	1.78	0.02	
Brent	1.74	0.00	
RBOB	1.24	0.00	
N+A naphtha	1.70	-0.02	
Ethylene	1.10	0.01	
Toluene	1.06	0.00	
Styrene	0.58	0.00	
Cumene	0.99	0.00	



## STYRENE-BENZENE SPREAD





**GLOBAL BENZENE PRICE SNAPSHOT**

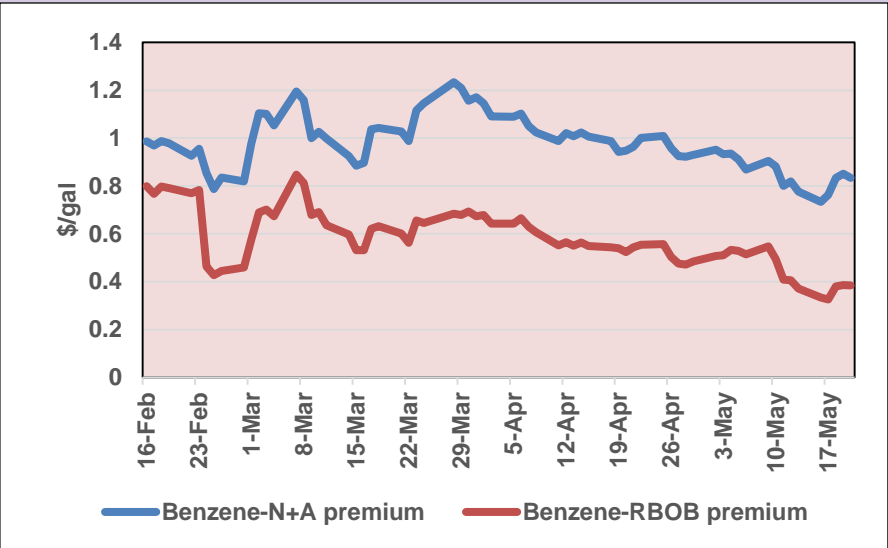
	Price	Change	MTD average
FOB Korea \$/mt	628.000	-5.000	642.964
FOB Korea \$/gal	2.100	-0.017	2.150
CIF ARA \$/mt	655.000	-5.000	670.433
CIF ARA \$/gal	2.191	-0.017	2.242
US DDP HTC \$/mt	603.980	0.000	598.399
US DDP HTC \$/gal	2.020	0.000	2.001

**GLOBAL OUTAGES**

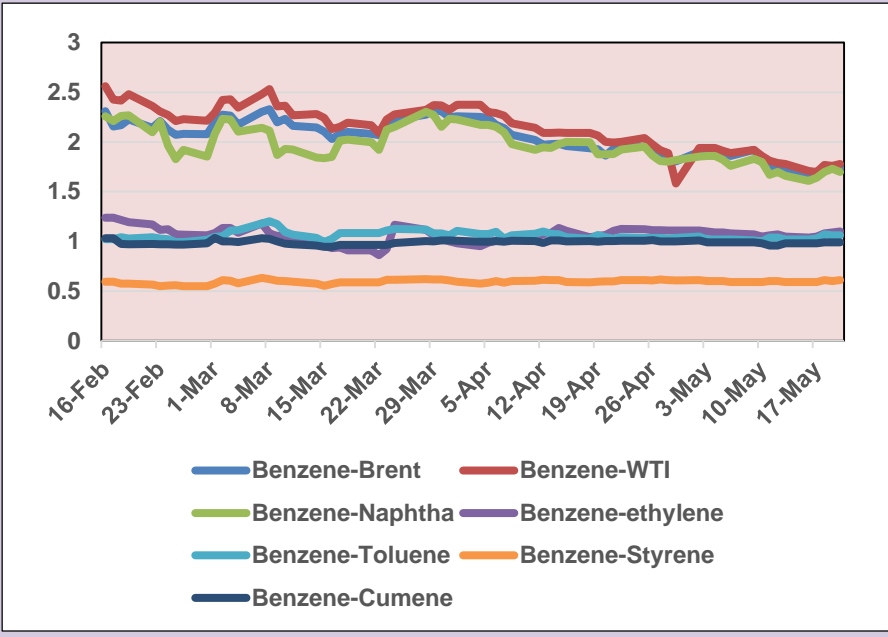
Company	Unit	Location	Capacity	Timing	Duration
<b>NORTH AMERICA</b>					
Styrolution	SM	Sarnia	431,000 mt	1-May-16	End June
<b>EUROPE</b>					
Unipetrol	BZ	Litvinov	250,000 mt	13-Aug-15	1-Jul-16
Shell	POSM	Moerdijk	450,000 mt	March	1-Jun-16
Trinseo	SM	Bohlen	300,000 mt	1-Apr-16	End May
<b>ASIA</b>					
Idemitsu SM Malaysia	SM	Pasir Gudang	240,000 mt	Mid-Apr	40-45 days
Taiwan Styrene Monomer	SM	Kaoshiung	160,000 mt	1-May-16	1 month
ONGC Mangalore	BZ/PX	Mangalore	300,000 mt	9-May-16	TBD
JX Nippon Oil	BZ/MX	Muroran	120,000 mt	May	1 month
JX Nippon Oil	BZ/MX	Ooita	120,000 mt	May	2 months
*Denka	SM	Chiba	270,000 mt	28-May-16	End July
<b>MIDDLE EAST</b>					
KPPC	BZ	Shuaiba	390,000 mt	1-Nov-16	25 days

\*denotes new or modified entry

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**BENZENE RATIOS**



www.PetroChemWire.com



**BLENDSTOCK VALUES (\$/GAL)**

	Differential	Change	Outright	Change	MTD avg
<b>Alkylate</b>	0.20000	0.00000	1.6856	0.01670	1.65331
<b>Raffinate</b>	-0.29000	0.00000	1.1956	0.01670	1.11998
<b>Reformate</b>	0.38000	0.00000	1.86560	0.01670	1.82265
<b>Toluene blend value</b>	0.54942	-0.01509	2.01252	0.00411	1.98720
<b>Mixed xylenes blend value</b>	0.66609	-0.02009	2.12919	-0.00089	2.12250
<b>Alkylate blend value</b>	0.17519	-0.00529	1.63829	0.01391	1.57177
<b>Reformate blend value</b>	0.49109	-0.01259	1.95419	0.00661	1.91992

**REFINERY FOCUS GLOSSARY**

**M2 gasoline:** Conventional 87 octane gasoline shipped on the Colonial Pipeline; 9 psi RVP. Essentially an export grade of gasoline.

**M3 gasoline:** Conventional 87 octane gasoline shipped on the Colonial Pipeline; 11.5 psi RVP.

**CBOB:** An 83.7-octane blendstock that is combined with 10% ethanol to create an 87-octane gasoline. The most common grade of gasoline sold in the US.

**VGO:** Intermediate feedstock used in the production of gasoline and diesel. Low and high sulfur vacuum gasoil is typically processed in a fluid catalytic cracking unit or a hydrocracker.

**Raffinate:** Used in gasoline blending, 2-6 psi RVP, approximately 65 octane. A by-product of aromatics extraction.

**Alkylate:** Used in gasoline blending due its high octane (92), low RVP (5.5), and low sulfur. Produced by reacting olefins (primarily propylene, but also butylene and amylene) with isobutane in the presence of a catalyst.

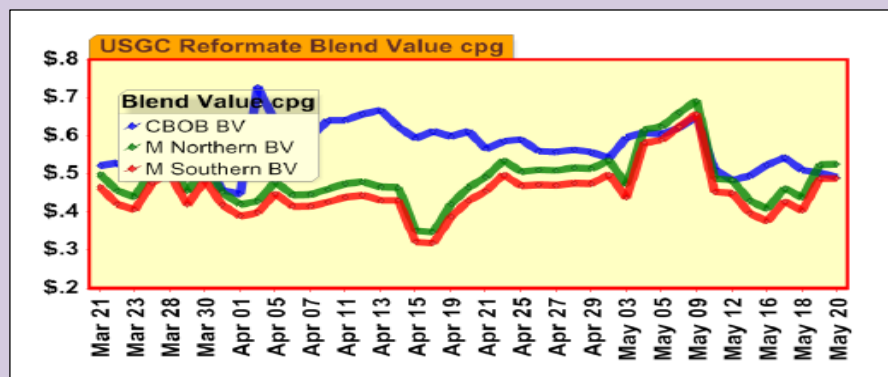
**Reformate:** A gasoline blendstock with an API gravity of about 30, a low RVP level of about 1 psi, and an octane of about 100.

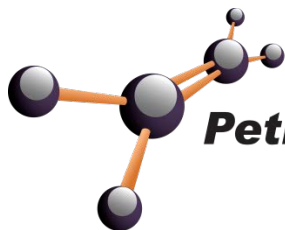
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**CASH GASOLINE / REGRADE PRICES**

	Price	Change	MTD avg
<b>US Gulf Coast gasoline (\$/gal)</b>			
CBOB 87	1.4631	0.0192	1.3755
CBOB 93	1.6381	0.0117	1.5773
CBOB Regrade Value	0.1750	-0.0075	0.2018
M grade	1.4856	0.0167	1.3953
<b>NY Harbor gasoline (\$/gal)</b>			
CBOB 87	1.5706	0.0017	1.4826
CBOB 93	1.7406	0.0017	1.6688
CBOB Regrade Value	0.1700	0	0.1862
<b>Group 3 gasoline (\$/gal)</b>			
CBOB 87	1.5431	0.0317	1.4080
CBOB 93	1.9331	0.0317	1.7470
CBOB Regrade Value	0.3900	0	0.3390
<b>3-2-1 Crack (\$/bbl)</b>			
NYMEX	18.91	0.62	17.3213
USG	12.79	1.09	10.8567
NYH	17.82	0.65	15.8860
Group 3	20.76	1.56	17.6640
<b>Ultra low sulfur diesel</b>			
US Gulf Coast \$/gal	1.4450	0.0110	1.3401





### NAPHTHA / VACUUM GASOIL PRICES

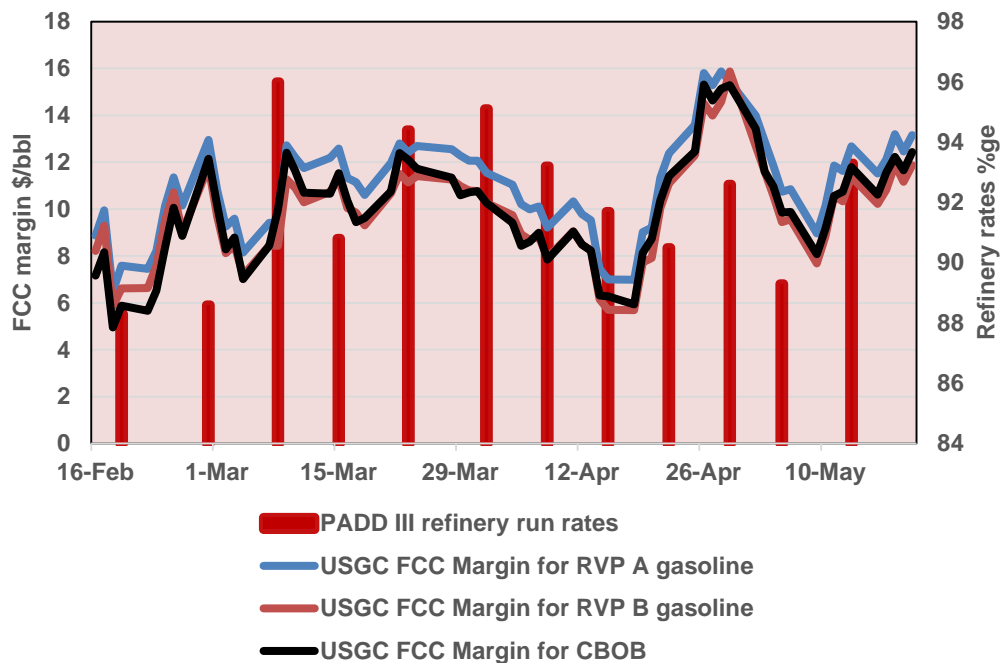
	Differential	Change	Outright	Change	MTD avg
N+A naphtha \$/gal	-0.300	0.000	1.186	0.017	1.148
Light naphtha \$/gal	0.050	0.000	1.060	0.000	0.994
LS Vacuum Gasoil cargoes \$/bbl	6.500	0.250	54.910	-0.010	52.130
HS Vacuum Gasoil cargoes \$/bbl	5.500	0.250	53.910	-0.010	51.130
LS Vacuum Gasoil barges \$/bbl	6.500	0.250	54.910	-0.010	52.130
HS Vacuum Gasoil barges \$/bbl	5.500	0.250	53.910	-0.010	51.130

### TODAY IN THE MARKETS

**Gasoline:** June NYMEX RBOB futures closed at 163.56 cpg, up 0.17 cpg. US Gulf cash gasoline differentials were higher versus Thursday's levels. A2 CBOB 87 regular was 1.75 cpg higher at 17.25 cpg under the screen. D2 CBOB 93 premium was 1.00 cpg higher at 0.25 cpg over the screen. RBOB was 0.50 cpg higher at 12.25 cpg under the screen. M2 was 1.50 cpg higher at 15 under the screen. The 3-2-1 crack in the Gulf Coast was \$12.79/bbl, \$6.11/bbl under the screen.

**Naphtha:** The N+A naphtha (62 API) differential was steady at M2 gasoline less 30 cpg (or an equivalent outright value of 118.6 cpg or \$420.53/mt). Heavy naphtha was unchanged at gasoline minus 27 cpg. Light naphtha (high sulfur) was flat at natural gasoline plus 5 cpg (106 cpg or \$396.44/mt).

**Blendstocks & vacuum gasoil:** Gasoline components' differentials were steady, while VGO differentials were up 25 cents. High sulfur barges were Jul WTI plus \$5.50/bbl (\$53.91/bbl). Low sulfur barges were at crude plus \$6.25/bbl (\$54.91/bbl). The low sulfur FCC margin based on the Jul crude differential and May product prices was \$13.16/bbl, up about \$0.60/bbl.



### 3-2-1 CRACK SPREADS

