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CONOCO INC.

PONCA CITY, OKLAHOMA
REFINING TECHNICAL SERVICES LABORATORY

Plt.: PC
File: 662.1
924
Date: 9/4/84

LABORATORY NO.: I-5-84
CHARGES: PC 49
SUBJECT: Summary of Benzene Content of Finished Gasolines and In-Plant Streams - 1977 to 1984 - Ponca City Refinery

CONCLUSION:

No. Ponca City Refinery finished gasolines or in-plant streams contain as much as 10.0 wt.% benzene. Therefore, the control provisions of EPA regulation 40 CFR 61, Subpart J, do not apply.

DISCUSSION:

A recently promulgated regulation from EPA mandates controls on benzene fugitive emissions at petroleum refineries. A key definition in the regulation is: "In benzene service means that a piece of equipment either contains or contacts a fluid that is at least 10 percent benzene by weight as determined according to the provisions of §61.245(d)." Unless fluids produced or used in the refinery contain at least 10 wt.% benzene, the controls in the regulation do not apply.

At R. L. Thorstenberg's request of 8/29/84, the results of previous laboratory studies of benzene in Ponca City Refinery streams are summarized in this report. Five major studies on this topic were made from 1977 through 1984. Benzene content of all the streams measured in them was lower than 10 wt.%.

Attachment II is a laboratory crosscheck comparing benzene concentrations determined using gas chromatography and infra-red analytical methods. The benzene results included in this report were obtained using both methods at different times. The method described in the regulation at §61.245(d) is gas chromatography.

ANALYTICAL DATA:

Attachment I.

REFERENCE:

1. Memo from R. L. Thorstenberg to R. S. Jones, dated 8/29/84.
2. Several laboratory reports dated in 1977, 1980, and 1984.

Approved:


Senior Technologist

bp

cc: GAO-RLT-EW-PLY-RSJ-KCH-F 3 1/2

Att: 2

Benzene
SAL 000000939

Attachment I
Benzene Content of Ponca City Refinery Finished
Products and In-Plant Streams

<u>Stream Description</u>	<u>Sample Date</u>	<u>Benzene Wt. %</u>
<u>Finished Gasolines</u>		
Regular Gasoline	7/84	1.3
Unleaded Gasoline	7/84	1.1
Super Unleaded Gasoline	7/84	0.6
Regular Gasoline	2/84	1.0
Unleaded Gasoline	2/84	0.7
Super Unleaded Gasoline	2/84	0.4
Regular Gasoline	7/80	1.3
Unleaded Gasoline	7/80	0.7
Regular Gasoline	1/80	1.4
Premium Gasoline	1/80	1.1
Unleaded Gasoline	1/80	0.9
Regular Gasoline	5/77	1.1
Premium Gasoline	5/77	0.5
Regular Gasoline	5/77	1.0
Regular Gasoline	5/77	1.1
Regular Gasoline	5/77	1.3
Premium Gasoline	5/77	0.4
Regular Gasoline	5/77	1.2
Regular Gasoline	5/77	0.8
Regular Gasoline	5/77	1.3
Premium Gasoline	5/77	0.3
Regular Gasoline	5/77	1.1
Regular Gasoline	5/77	1.3
Regular Gasoline	5/77	0.8
Regular Gasoline	5/77	1.0
Regular Gasoline	5/77	1.0
Regular Gasoline	5/77	1.1
Premium Gasoline	5/77	0.4
Premium Gasoline	5/77	0.7
Unleaded Gasoline	5/77	0.7
Conotane Gasoline	5/77	1.3
Regular Gasoline	5/77	1.0
Regular Gasoline	5/77	1.3
Regular Gasoline	5/77	1.0
Unleaded Gasoline	5/77	0.7
Regular Gasoline	5/77	1.3
Premium Gasoline	5/77	0.7
Regular Gasoline	5/77	1.0
Premium Gasoline	5/77	0.2
Unleaded Gasoline	5/77	0.7
Regular Gasoline	5/77	1.1
Regular Gasoline	5/77	1.3
Regular Gasoline	5/77	1.0
Premium Gasoline	5/77	0.3
Regular Gasoline	5/77	1.0
Premium Gasoline	3/77	0.7

Attachment I (Cont'd)

<u>Stream Description</u>	<u>Sample Date</u>	<u>Benzene Wt. %</u>
<u>Finished Gasolines (cont'd)</u>		
Regular Gasoline	3/77	1.2
Unleaded Gasoline	3/77	0.7
<u>Jet Fuels</u>		
JP-4, military	6/77	0.1
Q-Grade, commercial	5/77	<0.1
<u>In-Plant Streams</u>		
#5 FCC Lt. Gasoline	7/84	1.0
#5 FCC Hvy. Gasoline	7/84	0.3
#4 FCC Lt. Gasoline	7/84	0.8
#4 FCC Hvy. Gasoline	7/84	<0.1
#2 Reformer Charge	7/84	0.2
#2 Reformer Reformate (94 RON)	7/84	2.3
Alkylate	7/84	<0.1
#3 Reformer Charge	7/84	0.2
#3 Reformer Reformate (97 RON)	7/84	3.9
Straight Run Gasoline	7/84	1.3
Coker Gasoline	7/84	0.1
Cat Poly Gasoline	7/84	<0.1
#5 FCC Lt. Gasoline	2/84	1.1
#5 FCC Hvy. Gasoline	2/84	0.4
#4 FCC Lt. Gasoline	2/84	1.0
#4 FCC Hvy. Gasoline	2/84	<0.1
#2 Reformer Charge	2/84	0.2
#2 Reformer Reformate (89.5 RON)	2/84	2.0
Alkylate	2/84	0.3
#3 Reformer Charge	2/84	0.4
#3 Reformer Reformate (87.7 RON)	2/84	2.7
#3 Reformer Reformate (97.3 RON)	2/84	4.5
Straight Run Gasoline	2/84	1.4
Regular Coker Gasoline	2/84	0.1
Cat Poly Gasoline	2/84	<0.1
Casinghead Gasoline	7/80	0.5
Regular Coker Gasoline	7/80	0.2
Premium Coker Gasoline	7/80	0.4
Cat Poly Gasoline	7/80	<0.1
#4 FCC Lt. Gasoline	7/80	1.3
#4 FCC Hvy Gasoline	7/80	0.1
#5 FCC Lt. Gasoline	7/80	1.1
#5 FCC Hvy. Gasoline	7/80	0.2
Alkylate	7/80	<0.1
#2 Reformer Charge	7/80	0.2

Attachment II(Cont'd)

<u>Stream Description</u>	<u>Sample Date</u>	<u>Benzene Wt. %</u>
<u>In-Plant Streams (cont'd)</u>		
#2 Reformer Reformate (89.4 RON)	7/80	1.9
#3 Reformer Charge	7/80	0.2
#3 Reformer Reformate (89.5 RON)	7/80	2.0
Straight Run Gasoline	7/80	1.2
Straight Run Gasoline	1/80	1.3
Casinghead Gasoline	1/80	0.7
Regular Coker Gasoline	1/80	0.2
Premium Coker Gasoline	1/80	0.5
Hydro-treater Gasoline	1/80	0.2
Cat Poly Gasoline	1/80	<0.1
#4 FCC Lt. Gasoline	1/80	1.1
#4 FCC Hvy. Gasoline	1/80	<0.1
#5 FCC Lt. Gasoline	1/80	1.2
#5 FCC Hvy. Gasoline	1/80	0.1
Alkylate	1/80	<0.1
#2 Reformer Charge	1/80	0.1
#2 Reformer Reformate (90 RON)	1/80	1.2
#3 Reformer Charge	1/80	0.5
#3 Reformer Reformate (90 RON)	1/80	3.1
#2 Reformer Reformate	10/77	1.8
#3 Reformer Reformate	10/77	1.9
Total Alkylate	7/77	<0.1
Casinghead Gasoline	7/77	0.5
#1 CTU Raw Crude North Texas	6/77	0.1
#2 CTU Raw Crude West Texas and Foreign	6/77	<0.1
#4 CTU Raw Crude Oklahoma-Kingfisher	6/77	0.1
#5 CTU Raw Crude West Texas and Foreign	6/77	0.1
#2 Reformer Reformate	5/77	1.3
Straight Run Gasoline	5/77	1.3
Cat Poly Gasoline	5/77	<0.1
#5 FCC Gasoline	5/77	0.6
#5 FCC Lt. Gasoline	4/77	0.6
#5 FCC Hvy. Gasoline	4/77	0.6
Coker Gasoline	4/77	0.1
#4 FCC Hvy. Gasoline	4/77	<0.1
#4 FCC Lt. Gasoline	4/77	0.4
#3 Reformer Charge	4/77	0.2
#3 Reformer Reformate	4/77	1.5
Straight Run Gasoline	4/77	1.8



Interoffice Communication

To K. C. Hunt
From T. E. Courtney
Date July 21, 1977
Subject Crosscheck - IR vs GC Analysis for Benzene in Gasoline Type Samples

DATA:

Sample	IR	L.V.% Benzene	
		GC	
		D-3606 Std. Calib. Curve	Response Factors Internal Std.
1. PC 1033, IBP-400°F OH Cut from Crude	trace	0.04	0.04
2. PC 1070, IBP-400°F OH Cut From Crude	0.2	0.2	0.2
3. TK 151 Regular Gaso.	0.8	1.0	1.0
4. PC 2578, Unleaded Gaso.	0.5	0.5	0.5
5. TK 151 Recheck	0.8	1.0	1.0
6. PC 5163 Unleaded Gaso. ✓	0.4	0.4	0.4
7. PC 5164 Unleaded Gaso.	0.6	0.6	0.6
8. PC 5165 Unleaded Gaso.	0.9	0.9	0.9
9. PC 5166 Unleaded Gaso.	1.2	1.2	1.2
10. PC 5167 (PC 5163 + added 1.0 LV% Bz)	1.4	1.5	1.5
11. PC 5168 (PC 5163 + added 1.5 LV% Bz)	1.8	2.0	2.0

Spikes

T. E. Courtney
bp

SAL 000000943

Lab. No. E-74-7

VOL.% BENZENE IN FINISHED GASOLINE

BILLINGS REFINERY

				<u>VOL.</u>
PC 1538	Bi 300	Regular	March 1977	0.9
PC 1539	Bi 301	Premium	March 1977	0.5
PC 5998	SAS	Regular	5-11-77	1.1
PC 5999	SAS	Premium	5-11-77	0.5
PC 5000	SAS	Unleaded	5-11-77	0.7

DENVER REFINERY

				<u>VOL.</u>
PC 2419	De 77-124	Unleaded	March 1977	0.5
	Denver	Regular	March 1977	0.5
PC 2426	De 77-128	Premium	March 1977	0.6
PC 2298		Regular		0.6

WRENSHALL REFINERY

				<u>VOL.</u>
PC 1781		Regular	March 1977	0.5
PC 1782		Premium	March 1977	0.7
PC 5001	SAS	Regular		0.7
PC 5002	SAS	Premium		0.6
PC 5003	SAS	Unleaded		0.6

LAKE CHARLES REFINERY

				<u>VOL.</u>
PC 1520	LC 232-77	Unleaded	March 1977	1.5
PC 1521	LC 344-77	Regular	March 1977	1.0
PC 1522	LC 345-77	Premium	May 1977	1.1
PC 1839	LC 640-77	Regular	May 1977	1.1
PC 1840	LC 641-77	Premium	May 1977	1.0
PC 1841	LC 642-77	Unleaded	May 1977	1.1

PARAMOUNT REFINERY

				<u>VOL.</u>
PC 1434	PTX-2-77	Unleaded	March 1977	1.2
PC 1435	PTX-2A-77	Premium	March 1977	1.0

(Cont'd)

VOL.% BENZENE OF REFINERY STREAMS

WRENSHALL

PC 1657 St. Run	1.2
PC 1659 Hvy FCC	0.2
PC 1661 FCC Stab. Btms.	0.3
PC 1662 Reformate	0.7
PC 1663 Desulf Chg.	0.1
PC 1660 Lt. FCC Gaso	0.7

Doraville, Ga. Terminal

%

PC 1873 TK 10 Regular 5-19-77	1.1
PC 1874 TK 5 Premium 5-19-77	1.0
PC 1875 Unleaded 5-19-77	0.9
PC 1876 CLK 22-13A 5-19-77	0.8