

TABLE 57.—Benzene and toluene formed from cracking Oklahoma crude oil in 10-tube furnaces (tubes 8 inches in diameter and 14 feet long) at varying pressures and rates of oil feed.^a

[Temperatures varied from 600° C. to 800° C., and were determined by judging the color of the tubes, aided in some cases by pyrometer inserted in checker work of furnace. In determining specific gravities for runs in multiple-tube furnaces, covering quantities ranging from 1 to 1,500 gallons, the values indicated are correct within 0.02.]

Pressure per square inch.	Rate of oil feed per hour.	Oil used.	Oil recovered.	Specific gravity of oil recovered.	Benzene in recovered oil.	Toluene in recovered oil.	Total benzene and toluene in recovered oil.	Benzene formed on basis of original oil.	Toluene formed on basis of original oil.	Total benzene and toluene formed on basis of original oil.
Pounds.	Gallons.	Gallons.	Per cent.		Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
100	18	1,334	38	0.92	7.9	5.3	13.2	3.0	2.0	5.0
100	18	1,343	34	.94	8.5	7.9	16.4	2.9	2.7	5.6
150	23	1,461	37	.93	8.7	7.0	15.7	3.2	2.6	5.8
150	25	1,829	25	.96	12.8	8.8	21.6	3.2	2.2	5.4
150	27	866	27	.97	12.6	9.6	22.2	3.4	2.6	6.0
175	26	1,114	31	.94	11.6	10.0	21.6	3.6	3.1	6.7
175	26	1,286	32	.94	11.5	10.6	22.1	3.8	3.5	7.3
175	26	1,360	37	.93	10.8	8.9	19.7	4.0	3.3	7.3
175	26	1,365	37	.91	8.7	6.2	14.9	3.2	2.3	5.5
175	26	1,393	31	.93	10.3	9.4	19.7	3.2	2.9	6.1
175	27	961	26	.94	11.9	9.2	21.1	3.1	2.4	5.5
200	27	1,363	30	.91	9.7	7.7	17.4	2.9	2.3	5.2
200	28	1,494	25	.93	12.8	9.6	22.4	3.2	2.4	5.6
250	30	200	33	.....	15.1	7.6	22.7	5.0	2.5	7.5
250	30	200	33	.....	15.1	7.6	22.7	5.0	2.5	7.5
250	30	210	21	.....	30.9	10.5	41.4	6.5	2.2	8.7
250	30	240	33	.....	18.8	7.0	25.8	6.2	2.3	8.5
250	30	252	28	.....	19.6	6.8	26.4	5.5	1.9	7.4
250	30	333	31	.93	13.9	10.0	23.9	4.3	3.1	7.4
250	30	333	25	.....	24.0	8.8	32.8	6.0	2.2	8.2
250	30	363	23	.....	28.0	10.9	38.9	6.2	2.5	8.7
250	30	382	24	.....	27.1	9.0	36.1	6.5	2.3	8.8
250	30	387	26	.....	23.8	7.7	31.5	6.2	2.0	8.2
250	30	453	20	.96	17.5	8.0	25.5	3.5	1.6	5.1
250	30	460	25	.....	26.0	10.4	36.4	6.5	2.6	9.1
250	30	483	33	.....	18.8	6.7	25.5	6.2	2.2	8.4
250	30	512	32	.....	20.3	7.5	27.8	6.5	2.4	8.9
250	30	536	22	.....	25.4	10.4	35.8	5.6	2.3	7.9
250	30	580	30	.....	20.0	7.7	27.7	6.0	2.3	8.3
250	30	634	19	.....	34.7	11.6	46.3	6.6	2.2	8.8
250	30	667	24	.....	23.3	7.9	31.2	5.6	1.9	7.5
250	30	725	26	.....	23.1	7.7	30.8	6.0	2.0	8.0
250	30	762	26	.....	24.2	8.9	33.1	6.3	2.3	8.6
250	30	884	24	.94	12.9	10.0	22.9	3.1	2.4	5.5
250	30	1,070	27	.....	25.2	8.9	34.1	6.8	2.4	9.2
250	30	1,072	22	.....	27.3	9.6	36.9	6.0	2.1	8.1
250	30	1,137	22	.96	10.0	10.0	20.0	4.4	2.2	6.6
250	30	1,490	24	.....	25.0	8.8	33.8	6.0	2.1	8.1
250	30	1,529	26	.....	24.2	8.8	33.0	6.3	2.3	8.6

^a Results low, due to insufficient condensation.

It will be noted that with the Oklahoma crude oil, the percentage of benzene formed exceeds on an average the percentage of toluene formed. This is in sharp contrast with later results, obtained with the use of the distillate oil, in which the percentage of toluene exceeds that of benzene. (See page 165.)

The yields of benzene and toluene shown in this table are, on the whole, less than the yields obtained with the same oil in the single-tube furnaces. The wide variation both in the specific gravities and in the total amounts of benzene and toluene formed is to be explained by the different temperatures which existed during the course of the runs. Heat control is of course the most vital factor in the process