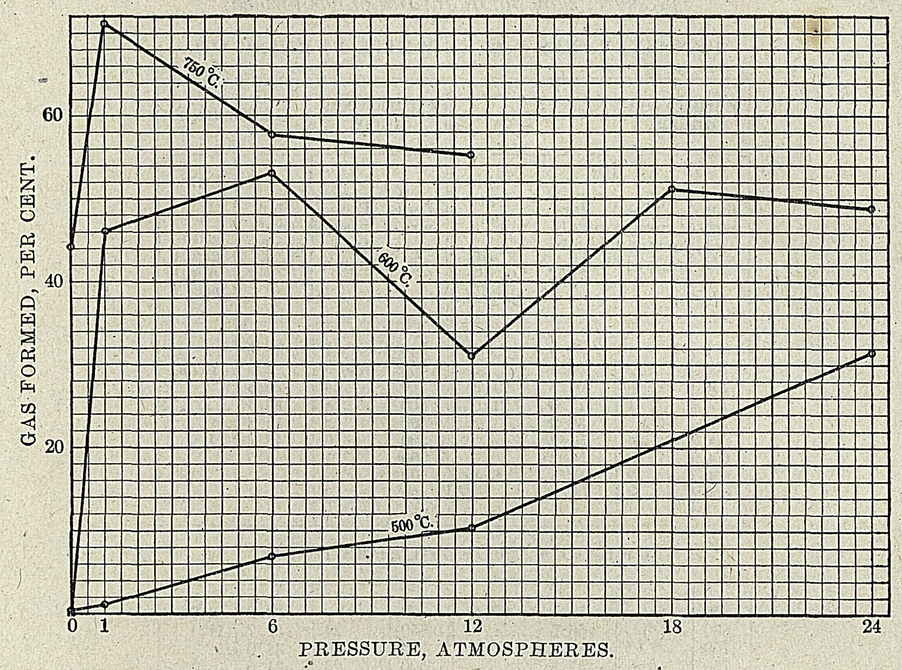

FIGURE 24.—Curves showing percentages of gas formed from cracking Oklahoma fuel-oil residuum with varying temperatures and pressures. Results for higher pressures are high, owing to oil consumed in building up pressures.

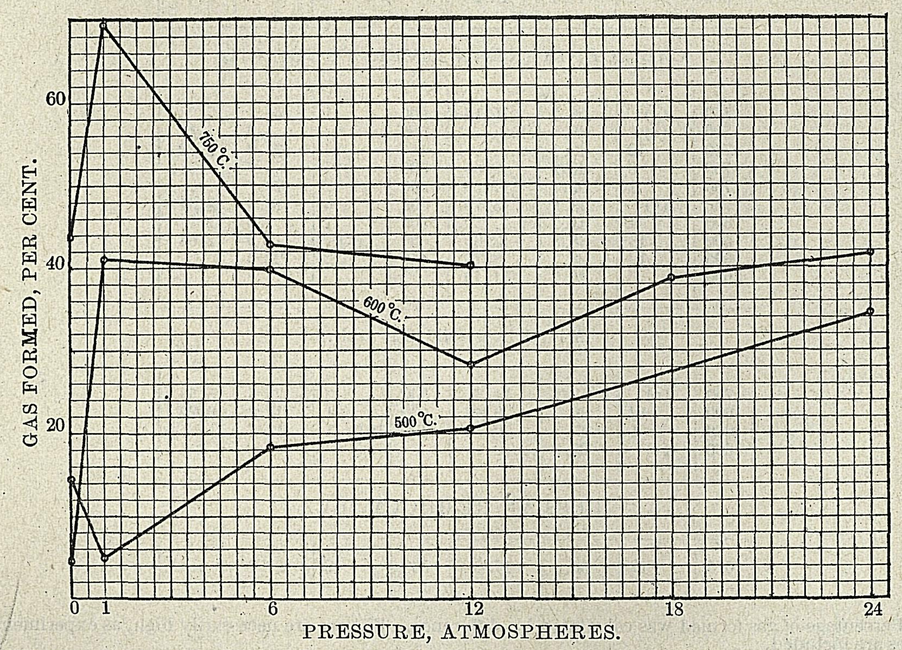

FIGURE 25.—Curves showing percentages of gas formed from cracking a California (Kern River) crude oil with varying temperatures and pressures. Results for higher pressures are high because of oil consumed in building up pressures.

GASOLINE FORMATION.

To set a satisfactory standard for what constitutes gasoline is difficult. The upper limit of temperature of the so-called gasoline fraction in the distillation of refinable crude petroleum is being extended from 150° to 170° C., and perhaps higher. Furthermore, there is a wide variance in the physical properties and chemical constitution of the oils that are commercially marketed under the name of gasoline. These differences are not of primary importance so far as this report is concerned, but they are mentioned to show the difficulty of adopting a reasonably satisfactory definition. For present purposes the magnitude of the distillation cut at 150° C. obtained from recovered oil is used as a measure of its gasoline content. A report now in preparation will deal with the characteristics of the various commercial gasolines and their suitability for various uses.

The calculations on which the figures for quantitative yields are based were made as follows:

The amount of the distillation cut below 150° C. for the original oil was deducted from the like figure for the recovered oil. The figure for the recovered oil was then reduced to terms of the original oil, showing the degree of transformation into gasoline hydrocarbons boiling below 150° C. Tables 19 and 20 show the results obtained with the four oils mentioned.

TABLE 19.—*Results of cracking the four oils under various conditions of temperature and pressure, showing percentage of gasoline (distillation cut up to 150° C.) obtained, calculated on basis of original oil.*[a]

Furnace conditions.		Percentage of gasoline formed by cracking oil from—				Average amount of gasoline formed.
Temperature.	Pressure.	Pennsylvania.	Oklahoma.	California.	Mexico.	
° C.	*Atmospheres.*					
850	1	2.3	.....	.....	.....	2.3
850	([b])	.....	4.2	4.8	.....	4.5
800	([b])	.....	5.6	8.8	.....	7.2
750	12	5.5	8.8	10.0	.....	8.1
750	6	6.2	5.8	8.2	.....	6.7
750	1	4.3	4.7	5.1	.....	4.7
750	([b])	4.5	7.5	4.0	4.6	5.1
650	([b])	.....	3.0	.....	.....	3.0
600	24	13.3	12.9	10.7	.....	12.3
600	18	15.8	16.6	13.0	.....	15.1
600	12	16.3	12.1	11.8	11.6	12.9
600	6	10.0	14.1	15.7	.....	13.3
600	1	13.4	12.7	10.6	8.1	11.2
600	([b])	.0	2.5	5.3	3.1	3.6
550	24	.....	12.4	12.1	.....	12.3
550	18	.....	17.3	.....	.....	17.3
500	24	18.1	14.0	13.5	.....	15.2
500	18	15.3	13.8	.....	.....	14.6
500	12	16.0	10.9	14.3	14.6	13.7
500	6	5.9	4.7	13.7	10.6	8.7
500	1	2.7	.0	7.0	.....	4.9
500	([b])	.0	.....	1.1	.....	1.1
450	18	.....	9.4	.....	.....	9.4
450	12	6.5	8.8	7.2	.....	7.5
400	10	.....	.....	.....	7.1	7.1

[a] Results for higher pressures low on account of oil consumed in building up pressures.
[b] Vacuum.