

TABLE 6. TYPICAL GAS ANALYSES
Constituents of Gas—Percent by Volume

No. Type	Source	CO ₂	O ₂	N ₂	CO	H ₂	CH ₄	C ₂ H ₆	C ₃ H ₈	C ₄ H ₁₀	Sp. Grav. Gross	Btu per Cu Ft.	
												Gross	Net
1 Natural	Birmingham, Ala.	..	..	5.0	..	..	90.0	5.0	..	..	0.60	1002	904
2 Natural	Pittsburgh, Pa.	..	..	0.8	..	..	83.4	15.8	..	..	0.61	1129	1021
3 Natural	Los Angeles, Calif.	6.5	..	..	..	..	77.5	16.0	..	..	0.70	1073	971
4 Natural	Kansas City, Mo.	0.8	..	8.4	..	..	84.1	6.7	..	..	0.63	974	879
5 Natural	Reported by Ley	0.5	..	12.8	..	..	72.3	14.4	..	..	0.68	990	896
6 Natural	Dry type	0.2	..	0.6	..	..	99.2	..	..	..	0.56	1007	906
7 Natural	Wet type	1.1	..	..	..	..	87.0	4.1	2.6	2.0	0.71	1223	1109
8 Natural	Sweet type	..	..	2.8	..	..	73.1	12.8	..	..	0.68	1166	1056
9 Natural	Sour type	..	..	..	..	..	58.7	16.5	9.9	5.0	0.92	1489	1359
10 Natural	Casinghead type	..	..	..	..	..	36.7	14.5	23.5	14.9	1.29	2133	1959
11 Propane	Commercial (natural gas)	..	..	..	..	..	..	..	..	..	1.55	2558	2358
12 Propane	Commercial (refinery gas)	..	..	..	..	..	..	..	..	..	1.77	2504	2316
13 Butane	Commercial (natural gas)	..	..	..	..	..	..	..	..	..	2.04	3210	2961
14 Butane	Commercial (refinery gas)	..	..	..	..	..	..	..	..	..	2.00	3184	2935
15 Butane-air		..	..	..	..	..	..	..	..	..	1.16	550	516
16 Refinery oil	Liq. phase crack (Cross) ^a	0.2	0.6	1.2	6.1	4.4	72.5	..	..	..	1.00	1650	1524
17 Reformed natural	Straight shot generator	1.7	0.3	1.5	13.6	48.3	33.0	..	1.2	..	0.41	559	497
18 Reformed natural	Water gas generator	1.2	0.1	3.8	22.3	49.8	21.9	..	0.83	..	0.44	464	424
19 Refinery oil	Vapor phase crack	2.3	0.2	0.5	1.2	13.1	23.3	32.9	39.6	..	0.89	1475	1351
20 Reformed refinery oil		2.3	0.7	4.9	20.8	49.8	12.3	5.5	3.7	..	0.51	530	475
21 Oil gas	Portland	1.2	0.5	2.4	7.7	54.2	30.1	..	3.9	..	0.37	570	510

(Illuminants)

Fuels and Combustion

TABLE 6. TYPICAL GAS ANALYSES (CONCLUDED)
Constituents of Gas—Percent by Volume

No. Type	Source	CO ₂	O ₂	N ₂	CO	H ₂	CH ₄	C ₂ H ₆	C ₃ H ₈	C ₄ H ₁₀	Sp. Grav. Gross	Btu per Cu Ft.	
												Gross	Net
22 Coal gas	Horizontal retort	2.4	0.8	11.3	7.4	48.0	27.1	..	..	..	0.47	542	486
23 Coal gas	Inclined retort	1.7	0.8	8.1	7.3	49.5	29.2	..	..	..	0.47	599	540
24 Coal gas	Contin. vert.	3.0	0.2	4.4	10.9	54.5	24.2	..	..	..	0.42	532	477
25 Coal gas	Inter. vert.	2.1	0.5	8.2	6.9	49.7	29.9	..	..	..	0.41	540	482
26 Coke oven	Inter. vert. chamber	2.1	0.4	4.4	13.5	51.9	24.3	..	..	..	0.42	520	466
27 Coke oven	By-product	2.0	0.03	4.8	5.5	51.9	32.3	..	..	..	0.40	569	509
28 Producer	Buckwheat anthr.	8.0	0.1	50.0	23.2	17.7	1.0	..	..	..	0.86	143	133
29 Producer	Bituminous	4.5	0.6	50.9	27.0	14.0	3.0	..	..	..	0.88	163	153
30 Producer	Coke + 0.6 lb. steam	6.4	..	52.8	27.1	13.3	0.4	..	..	..	0.88	135	128
31 Blast furnace		11.5	..	60.0	27.5	1.0	..	..	..	..	1.02	92	92
32 Blue gas	Coke	5.4	0.7	8.3	37.0	47.3	1.3	..	..	..	0.57	287	262
33 Blue gas	Bituminous	5.5	0.9	27.6	28.2	32.6	4.6	..	..	..	0.70	260	239
34 Carburetted water	Low gravity backrun	3.6	0.4	5.0	21.9	49.6	10.9	2.5	..	..	0.54	536	461
35 Carburetted water	Heavy oil with blow run	6.0	0.9	12.4	26.8	82.2	13.5	..	..	..	0.66	530	451
36 Carburetted water		4.3	0.7	6.5	32.0	84.0	15.5	..	..	..	0.67	534	493
37 Carburetted water	High Btu	0.7	0.3	5.8	11.7	28.0	36.1	..	..	..	0.63	840	770
38 Sewage	Decatur, Ill.	22.0	..	6.0	..	2.0	68.0	..	..	..	0.79	690	621

This table from Gaseous Fuels, American Gas Association, p. 82.

Nos. 1-4 Are average compositions as served to customers in cities named.

6-10 Ley, "Geology of Natural Gas," p. 1073.

11-14 "Handbook of Natural Gas," p. 1073.

15 "Handbook of Butane and Propane Gases."

16 "Gas Engineers' Handbook, p. 171."

17 "Natural Gas," May 1929, p. 556.

18 "A.G.A. Proc., 1935, p. 781."

19 "Gas Engineers' Handbook, p. 171."

20 "E. L. Hart, U.S. Nat. Bur. of Mines, p. 171."

21 "Combustion," Third Edition, A.G.A.

No. 26 Average data 20 days, United Engineers & Constr.

27 H. C. Porter, Coal Carbonization, C. A.

28-31 "Combustion," A.G.A. Proc., 1922, pp. 21-52.

32 E. F. Fisher, A.G.A. Proc., 1929, Revised Air-Blast Process.

33 A.G.A. Proc., 1930, pp. 1490-1502.

34 A.G.A. Proc., 1930, p. 1335.

35 "Combustion," Third Edition, A.G.A.

36 A.G.A. Proc., 1934, p. 929.

37 Private memorandum; Morse Boulder Destructor Co.

^a Divided 16.5% isobutane, 50.1% n-butane.^b Divided 23.3% isobutane, 70.7% n-butane.Dubbs process produces less illuminants (6.7%) and 65% CH₄ and 16% C₂H₆.