Source: Heywood, J., "Internal Combustion Engine Fundamentals," 1988.

TABLE D.4
Data on fuel properties

Fuel	Formula (phase)	Molecular weight	Specific gravity: (density,† kg/dm³)	Heat of vaporization, kJ/kg‡	Specific heat		Higher heating value, MJ/kg	Lower heating value, MJ/kg	LHV of stoich. mixture, MJ/kg	$(A/F)_s$	$(F/A)_s$	Fuel octane rating	
					Liquid, kJ/kg · K	Vapor c_p, kJ/kg · K						RON	MON
Practical fuels§													
Gasoline	$C_nH_{1.87n}$(l)	~110	0.72–0.78	350	2.4	~1.7	47.3	44.0	2.83	14.6	0.0685	91–99	82–89
Light diesel	$C_nH_{1.8n}$(l)	~170	0.78–0.84	270	2.2	~1.7	46.1	43.2	2.79	14.5	0.0690	—	—
Heavy diesel	$C_nH_{1.7n}$(1)	~200	0.82–0.88	230	1.9	~1.7	45.5	42.8	2.85	14.4	0.0697	—	—
Natural gas	$C_nH_{3.8n}N_{0.1n}$(g)	~18	(~0.79†)	—	—	~2	50	45	2.9	14.5	0.069	—	—
Pure hydrocarbons													
Methane	CH_4(g)	16.04	(0.72†)	509	0.63	2.2	55.5	50.0	2.72	17.23	0.0580	120	120
Propane	C_3H_8(g)	44.10	0.51 (2.0†)	426	2.5	1.6	50.4	46.4	2.75	15.67	0.0638	112	97
Isooctane	C_8H_{18}(l)	114.23	0.692	308	2.1	1.63	47.8	44.3	2.75	15.13	0.0661	100	100
Cetane	$C_{16}H_{34}$(l)	226.44	0.773	358		1.6	47.3	44.0	2.78	14.82	0.0675	—	—
Benzene	C_6H_6(l)	78.11	0.879	433	1.72	1.1	41.9	40.2	2.82	13.27	0.0753		115
Toluene	C_7H_8(l)	92.14	0.867	412	1.68	1.1	42.5	40.6	2.79	13.50	0.0741	120	109
Alcohols													
Methanol	CH_4O(l)	32.04	0.792	1103	2.6	1.72	22.7	20.0	2.68	6.47	0.155	106	92
Ethanol	C_2H_6O(l)	46.07	0.785	840	2.5	1.93	29.7	26.9	2.69	9.00	0.111	107	89
Other fuels													
Carbon	C(s)	12.01	~2§	—	—	—	33.8	33.8	2.70	11.51	0.0869		
Carbon monoxide	CO(g)	28.01	(1.25†)	—	—	1.05	10.1	10.1	2.91	2.467	0.405		
Hydrogen	H_2(g)	2.015	(0.090†)	—	—	1.44	142.0	120.0	3.40	34.3	0.0292		

(l) liquid phase; (g) gaseous phase; (s) solid phase.
† Density in kg/m³ at 0°C and 1 atm.
‡ At 1 atm and 25°C for liquid fuels: at 1 atm and boiling temperature for gaseous fuels.
§ Typical values.
RON, research octane number; MON, motor octane number.

Sources:
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