

LAMPIRAN

Lampiran 1

TABLE A-2 PROPERTIES OF FUELS

Fuel	Molecular Weight	Heating Value		Stoichiometric		Octane Number		Heat of Vaporization (kJ/kg)	Cetane Number	
		HHV (kJ/kg)	LHV (kJ/kg)	(AF) _s	(FA) _s	MON	RON			
gasoline	C ₈ H ₁₈	111	47300	43000	14.6	0.068	80-91	92-99	307	
light diesel	C _{12.2} H _{22.2}	170	44800	42500	14.5	0.069			270	40-55
heavy diesel	C _{16.6} H _{34.6}	200	43800	41400	14.5	0.069			230	35-50
isooctane	C ₈ H ₁₈	114	47810	44300	15.1	0.066	100	100	290	
methanol	CH ₃ OH	32	22540	20050	6.5	0.155	92	106	1147	
ethanol	C ₂ H ₅ OH	46	29710	26950	9.0	0.111	89	107	873	
methane	CH ₄	16	55260	49770	17.2	0.058	120	120	509	
propane	C ₃ H ₈	44	50180	46190	15.7	0.064	97	112	426	
nitromethane	CH ₃ NO ₂	61	12000	10920	1.7	0.588			623	
heptane	C ₇ H ₁₆	100	48070	44560	15.2	0.066	0	0	316	
octane	C ₈ H ₁₈	114	47280	43980	15.0	0.066			292	100
heptamethylnonane	C ₁₇ H ₃₄	178			15.9	0.063				15
α-methylnaphthalene	C ₁₁ H ₁₈	142			13.1	0.076				0
carbon monoxide	CO	28	10100	10100	2.5	0.405				
coal (carbon)	C	12	33800	33800	11.5	0.087				
butene-1	C ₄ H ₈	56	48210	45040	14.8	0.068	80	99	390	
triptane	C ₇ H ₁₆	100	47950	44440	15.2	0.066	101	112	288	
isodecane	C ₁₀ H ₂₂	142	47590	44220	15.1	0.066	92	113		
toluene	C ₇ H ₈	92	42500	40600	13.5	0.074	109	120	412	
hydrogen	H ₂	2	141800	120900	34.5	0.029		90		

TABLE A-2

Ideal-gas specific heats of various common gas

(a) At 300 K

Gas	Formula	$C_{p, constant}$ J/kg · K	R J/kg · K	C_p kJ/kg · K	C_v kJ/kg · K	k
Air		0.2870	1.005	0.718	0.501	1.40
Argon	Ar	0.2081	0.2081	0.5122	0.3041	1.667
Butane	C ₄ H ₁₀	0.1433	0.1161	1.731	1.615	1.07
Carbon dioxide	CO ₂	0.1889	0.1889	0.845	0.656	1.29
Carbon monoxide	CO	0.2968	0.2968	1.040	0.743	1.40
Ethane	C ₂ H ₆	0.2765	0.2765	1.489	1.212	1.23
Ethylene	C ₂ H ₄	0.2964	0.2964	1.2518	0.9554	1.30
Helium	He	2.0769	2.0769	3.1156	1.0387	1.667
Hydrogen	H ₂	4.1240	4.1240	10.183	6.059	1.405
Methane	CH ₄	0.5182	0.5182	1.7354	1.2172	1.299
Neon	Ne	0.4119	0.4119	0.6179	0.2060	1.667
Nitrogen	N ₂	0.2968	0.2968	0.743	0.446	1.400
Octane	C ₈ H ₁₈	0.0729	0.0729	1.6385	1.5656	1.044
Oxygen	O ₂	0.2598	0.2598	0.658	0.398	1.395
Propane	C ₃ H ₈	0.1885	0.1885	1.4909	1.3024	1.126
Steam	H ₂ O	0.4615	0.4615	1.4108	0.9493	1.327

Note: The units are kJ/kg · K for C_p and C_v , and kJ/kg · K for R .

Source: Gordon and Janaki, *Thermodynamic Properties of Matter*, 3rd ed. (New York, Wiley & Sons, 1986), p. 687, Table A.8SI.