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Gases - Specific Heat Capacities and Individual Gas Constants

The specific heat capacities at constant pressure and constant volume processes, and the ratio of specific heat and the individual gas constant - R - for some common used "ideal gases", can be found in the table below (approximate values at 68oF (20oC) and 14.7 psia (1 atm)):

Gas or Vapor	Formula	Specific Heat Capacity				Ratio of Specific Heats	Individual Gas constant	
		cp (kJ/kg K)	cv (kJ/kg K)	cp (Btu/lbmoF)	cv (Btu/lbmoF)	κ = cp / cv	cp - cv (kJ/kg K)	cp - cv (ft lbf/lbmoR)
Acetone		1.47	1.32	0.35	0.32	1.11	0.15	
Acetylene	C2H2	1.69	1.37	0.35	0.27	1.232	0.319	59.34
Air		1.01	0.718	0.24	0.17	1.4	0.287	53.34
Alcohol	C2H5OH	1.88	1.67	0.45	0.4	1.13	0.22	
Alcohol	CH3OH	1.93	1.53	0.46	0.37	1.26	0.39	
Ammonia	NH3	2.19	1.66	0.52	0.4	1.31	0.53	96.5
Argon	Ar	0.52	0.312	0.12	0.07	1.667	0.208	
Benzene	C6H6	1.09	0.99	0.26	0.24	1.12	0.1	
Blast furnace gas		1.03	0.73	0.25	0.17	1.41	0.3	55.05
Bromine		0.25	0.2	0.06	0.05	1.28	0.05	
Butatiene						1.12		
Butane	C4H10	1.67	1.53	0.395	0.356	1.094	0.143	26.5
Carbon dioxide	CO2	0.844	0.655	0.21	0.16	1.289	0.189	38.86
Carbon monoxide	CO	1.02	0.72	0.24	0.17	1.4	0.297	55.14
Carbon disulphide		0.67	0.55	0.16	0.13	1.21	0.12	
Chlorine	Cl2	0.48	0.36	0.12	0.09	1.34	0.12	
Chloroform		0.63	0.55	0.15	0.13	1.15	0.08	
Combustion products		1		0.24				
Ethane	C2H6	1.75	1.48	0.39	0.32	1.187	0.276	51.5
Ether		2.01	1.95	0.48	0.47	1.03	0.06	
Ethylene	C2H4	1.53	1.23	0.4	0.33	1.24	0.296	55.08
Freon 22						1.18		
Helium	He	5.19	3.12	1.25	0.75	1.667	2.08	386.3
Hexane						1.06		
Hydrogen	H2	14.32	10.16	3.42	2.43	1.405	4.12	765.9
Hydrogen Chloride	HCl	0.8	0.57	0.191	0.135	1.41	0.23	42.4
Hydrogen Sulfide	H2S			0.243	0.187	1.32		45.2
Hydroxyl	OH	1.76	1.27			1.384	0.489	
Methane	CH4	2.22	1.7	0.59	0.45	1.304	0.518	96.4
Methyl Chloride	CH3Cl			0.24	0.2	1.2		30.6
Natural Gas		2.34	1.85	0.56	0.44	1.27	0.5	79.1
Neon		1.03	0.618			1.667	0.412	
Nitric Oxide	NO	0.995	0.718	0.23	0.17	1.386	0.277	
Nitrogen	N2	1.04	0.743	0.25	0.18	1.4	0.297	54.99
Nitrogen tetroxide		4.69	4.6	1.12	1.1	1.02	0.09	
Nitrous oxide	N2O	0.88	0.69	0.21	0.17	1.27	0.18	35.1
Oxygen	O2	0.919	0.659	0.22	0.16	1.395	0.26	48.24
Pentane						1.07		
Propane	C3H8	1.67	1.48	0.39	0.34	1.127	0.189	35
Propene (propylene)	C3H6	1.5	1.31	0.36	0.31	1.15	0.18	36.8
Water Vapor		1.93	1.46	0.46	0.35	1.32	0.462	
Steam 1 psia. 120 – 600 oF								
Steam 14.7 psia. 220 – 600 oF		1.97	1.5	0.47	0.36	1.31	0.46	
Steam 150 psia. 360 – 600 oF		2.26	1.76	0.54	0.42	1.28	0.5	
Sulfur dioxide (Sulphur dioxide)	SO2	0.64	0.51	0.15	0.12	1.29	0.13	24.1

κ = cp / cv - the specific heat capacity ratio
cp = specific heat in a constant pressure process
cv = specific heat in a constant volume process
R- Individual Gas constant