

## DATA SHEET

### COMMON PHYSICAL QUANTITIES

Quantity	Symbol	Value	Quantity	Symbol	Value
Gravitational acceleration on Earth	$g$	$9.8 \text{ m s}^{-2}$	Mass of electron	$m_e$	$9.11 \times 10^{-31} \text{ kg}$
Radius of Earth	$R_E$	$6.4 \times 10^6 \text{ m}$	Charge on electron	$e$	$-1.60 \times 10^{-19} \text{ C}$
Mass of Earth	$M_E$	$6.0 \times 10^{24} \text{ kg}$	Mass of neutron	$m_n$	$1.675 \times 10^{-27} \text{ kg}$
Mass of Jupiter	$M_J$	$1.90 \times 10^{27} \text{ kg}$	Mass of proton	$m_p$	$1.673 \times 10^{-27} \text{ kg}$
Radius of Jupiter	$R_J$	$7.15 \times 10^7 \text{ m}$	Mass of alpha particle	$m_\alpha$	$6.645 \times 10^{-27} \text{ kg}$
Mean Radius of Jupiter Orbit		$7.79 \times 10^{11} \text{ m}$	Charge on alpha particle		$3.20 \times 10^{-19} \text{ C}$
Solar radius		$6.955 \times 10^8 \text{ m}$	Planck's constant	$h$	$6.63 \times 10^{-34} \text{ J s}$
Mass of Sun		$2.0 \times 10^{30} \text{ kg}$	Permittivity of free space	$\epsilon_0$	$8.85 \times 10^{-12} \text{ F m}^{-1}$
1 AU		$1.5 \times 10^{11} \text{ m}$	Permeability of free space	$\mu_0$	$4\pi \times 10^{-7} \text{ H m}^{-1}$
Stefan-Boltzmann constant	$\sigma$	$5.67 \times 10^{-8} \text{ W m}^{-2} \text{ K}^{-4}$	Speed of light in vacuum	$c$	$3.00 \times 10^8 \text{ m s}^{-1}$
Universal constant of gravitation	$G$	$6.67 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$	Speed of sound in air	$v$	$3.4 \times 10^2 \text{ m s}^{-1}$

### REFRACTIVE INDICES

The refractive indices refer to sodium light of wavelength 589 nm and to substances at a temperature of 273 K.

Substance	Refractive index	Substance	Refractive index
Diamond	2.42	Glycerol	1.47
Glass	1.51	Water	1.33
Ice	1.31	Air	1.00
Perspex	1.49	Magnesium Fluoride	1.38

### SPECTRAL LINES

Element	Wavelength (nm)	Colour	Element	Wavelength (nm)	Colour
Hydrogen	656	Red	Cadmium	644	Red
	486	Blue-green		509	Green
	434	Blue-violet		480	Blue
	410	Violet	Lasers		
	397	Ultraviolet	Element	Wavelength (nm)	Colour
	389	Ultraviolet	Carbon dioxide	9550 } 10590 }	Infrared
Sodium	589	Yellow	Helium-neon	633	Red

### PROPERTIES OF SELECTED MATERIALS

Substance	Density ( $\text{kg m}^{-3}$ )	Melting Point (K)	Boiling Point (K)	Specific Heat Capacity ( $\text{J kg}^{-1} \text{ K}^{-1}$ )	Specific Latent Heat of Fusion ( $\text{J kg}^{-1}$ )	Specific Latent Heat of Vaporisation ( $\text{J kg}^{-1}$ )
Aluminium	$2.70 \times 10^3$	933	2623	$9.02 \times 10^2$	$3.95 \times 10^5$	....
Copper	$8.96 \times 10^3$	1357	2853	$3.86 \times 10^2$	$2.05 \times 10^5$	....
Glass	$2.60 \times 10^3$	1400	....	$6.70 \times 10^2$	....	....
Ice	$9.20 \times 10^2$	273	....	$2.10 \times 10^3$	$3.34 \times 10^5$	....
Glycerol	$1.26 \times 10^3$	291	563	$2.43 \times 10^3$	$1.81 \times 10^5$	$8.30 \times 10^5$
Methanol	$7.91 \times 10^2$	175	338	$2.52 \times 10^3$	$9.9 \times 10^4$	$1.12 \times 10^6$
Sea Water	$1.02 \times 10^3$	264	377	$3.93 \times 10^3$	....	....
Water	$1.00 \times 10^3$	273	373	$4.18 \times 10^3$	$3.34 \times 10^5$	$2.26 \times 10^6$
Air	1.29	....	....	....	....	....
Hydrogen	$9.0 \times 10^{-2}$	14	20	$1.43 \times 10^4$	....	$4.50 \times 10^5$
Nitrogen	1.25	63	77	$1.04 \times 10^3$	....	$2.00 \times 10^5$
Oxygen	1.43	55	90	$9.18 \times 10^2$	....	$2.40 \times 10^4$

The gas densities refer to a temperature of 273 K and a pressure of  $1.01 \times 10^5 \text{ Pa}$ .



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