

APPENDIX IV. *Energy conversion factors* (CODATA 1986)

Joule (J)	Kilowatthour (kWh)	Atomic mass unit (u)	Kilocalorie (kcal)	Electronvolt (eV)
1	$2.777\ 78 \times 10^{-7}$	$6.700\ 53 \times 10^9$	$2.388\ 46 \times 10^{-4}$	$6.241\ 46 \times 10^{18}$
$3.600\ 00 \times 10^6$	1	$2.412\ 19 \times 10^{16}$	$8.598\ 46 \times 10^2$	$2.246\ 93 \times 10^{25}$
$1.492\ 419 \times 10^{-10}$	$4.145\ 61 \times 10^{-17}$	1	$3.564\ 58 \times 10^{-14}$	$9.314\ 943 \times 10^8$
$4.186\ 80 \times 10^3$	$1.163\ 00 \times 10^{-3}$	$2.805\ 38 \times 10^{13}$	1	$2.613\ 20 \times 10^{22}$
$1.602\ 177 \times 10^{-19}$	$4.450\ 53 \times 10^{-26}$	$1.073\ 544 \times 10^{-9}$	$3.826\ 77 \times 10^{-23}$	1

$1\ \text{eV} = 1.602\ 177 \times 10^{-19}\ \text{J}$; $1\ \text{eV atom}^{-1} = 23.045\ 0\ \text{kcal mol}^{-1} = 96.485\ \text{kJ mol}^{-1}$
 $1\ \text{Q} = 10^{18}\ \text{Btu}$; $1\ \text{Btu (British thermal unit)} = 1.055\ 06\ \text{kJ}$; $1\ \text{hp (horse power)} = 0.746\ \text{kW}$
 $1\ \text{toe (ton oil equivalent)} = 10\ \text{Gcal} = 11.63\ \text{MWh} = 41.87\ \text{GJ}$
 $1\ \text{ton hard coal (tce)} = 0.65\ \text{toe} = 27.2\ \text{GJ}$; $1000\ \text{m}^3\ \text{natural gas} = 0.80\ \text{toe}$
 $1\ \text{g }^{235}\text{U fissioned at } 200\ \text{MeV/fission} = 82.11\ \text{GJ} = 0.95\ \text{MWd (heat)}$
 $1\ \text{erg (dyne cm)} = 1.000 \times 10^{-7}\ \text{J}$
 $\text{Energy-wavelength product } (\Delta E \lambda) = 12\ 398.5\ \text{eV \AA}$

Prefixes for powers of ten			Some numerical values		Some English measures	
E	exa	10^{18}	e	2.718 28	1 inch	0.025 4 m
P	peta	10^{15}	log e	0.434 29	1 (statue) mile	1 609.34 m
T	tera	10^{12}	ln 2	0.693 15	1 (int.) nautical mile	1 852 m
G	giga	10^9	ln 10	2.302 59	1 (US liq.) gallon	0.003785 m ³
M	mega	10^6	ln 2/ln 10	0.301 03	1 barrel	0.159 0 m ³
k	kilo	10^3	π	3.141 59	1 cubic foot	0.028 32 m ³
h	hecto	10^2	ln a = ln 10 \times log a		1 pound (mass)	0.4536 kg
d	deci	10^{-1}				
c	centi	10^{-2}				
m	milli	10^{-3}				
μ	micro	10^{-6}				
n	nano	10^{-9}				
p	pico	10^{-12}				
f	femto	10^{-15}				
a	atto	10^{-18}				