

1 Dimensional Analysis

Dimensional analysis is a method used to convert units from one measurement system to another. It involves multiplying by conversion factors, ensuring that units cancel appropriately.

1.1 Conversion Equations

Length Conversion Factors
1 Angstrom ($\text{\AA}$) = 0.1 nanometers (nm)
1 inch (in) = 2.54 centimeters (cm)
1 foot (ft) = 0.3048 meters (m)
1 mile (mi) = 1.60934 kilometers (km)

Table 1: Length Conversion Factors

Mass Conversion Factors
1 unified atomic mass unit (amu) = 1 dalton (Da)
1 Dalton (Da) = 1.660054×10^{-21} milligrams (mg)
1 ounce (oz) = 28.3495 grams (g)
1 pound (lb) = 0.453592 kilograms (kg)
1 tonne (ton) = 2000 pounds (lb)

Table 5: Mass Conversion Factors

Volume Conversion Factors
1 teaspoon (tsp) = 4.92892 milliliters (mL)
1 tablespoon (tbsp) = 14.7868 milliliters (mL)
1 fluid ounce (fl oz) = 29.5735 milliliters (mL)
1 cup = 0.236588 liters (L)
1 pint (pt) = 0.473176 liters (L)
1 quart (qt) = 0.946353 liters (L)
1 gallon (gal) = 3.78541 liters (L)

Table 2: Volume Conversion Factors

Pressure Conversion Factors
1 atmosphere (atm) = 101.325 kilopascals (kPa)
1 atmosphere (atm) = 760 millimeters of Hg (mmHg)

Table 3: Pressure Conversion Factors

Energy Conversion Factors
1 calorie (cal) = 4.184 joules (J)
1 kilocalorie (kcal) = 4184 joules (J)

Table 4: Energy Conversion Factors

Prefix	Symbol	Factor
Tera	T	10^{12}
Giga	G	10^9
Mega	M	10^6
Kilo	k	10^3
Hecto	h	10^2
Deka	da	10^1
(Base Unit)		10^0
Deci	d	10^{-1}
Centi	c	10^{-2}
Milli	m	10^{-3}
Micro	μ	10^{-6}
Nano	n	10^{-9}
Pico	p	10^{-12}
Femto	f	10^{-15}
Atto	a	10^{-18}

Table 6: Common Metric Prefixes

Time Unit Conversion Factors
1 minute (min) = 60 seconds (s)
1 hour (hr) = 60 minutes (min)
1 day (day) = 24 hours (hr)
1 week (wk) = 7 days (day)
1 month (mo) $\approx$ 30.44 days (day)
1 year (yr) $\approx$ 365.25 days (day)

Table 7: Time Conversions