



CHEMISTRY METRIC DIMENSIONAL ANALYSIS

- Show all of the following unit conversion problems using dimensional analysis.
- Show all work, round to correct sig figs. All answers must have units.

Introduction & Examples

- o Convert 92 centuries to years
- o If $2.54 \text{ cm} = 1.00 \text{ inch}$, convert 46.5 inches to centimeters.
- o Convert 84 miles to kilometers ($0.6 \text{ miles} = 1 \text{ kilometer}$)
- o Convert 27 months to fortnights (there are 14 days in a fortnight and ~ 30 days in a month)

1 step

1. A piece of property is found to be 499 decimeters (dm) long. Find the length in (cm)?
2. How many millimeters are there in 5.97×10^{-6} meters (m)?
3. A book is found to have a mass 0.6321 kilogram (kg). Calculate its mass in grams (g).
4. How many decigrams (dg) are there in 0.822 milligram (mg)?
5. A 2.50 L bottle of soda contains how many milliliters (mL)?
6. What is the mass in kilograms of a 2.20×10^5 gram bag of fertilizer?
7. 2356 decigrams is equivalent to how many grams?

2 Step

1. Calculate the number of centimeters (cm) there are in 6.245101 kilometers (km).
2. A very small object is found to have a length of 3.44×10^{-4} cm. Convert to millimeters (mm).
3. Calculate the number of milligrams (mg) there are in 10.00 kilograms (kg).
4. How many decigrams (dg) are there in 0.822 milligram (mg)? Calculate the number of kilometers (km) there are in 1.549 millimeters (mm).
5. Calculate the number of milligrams (mg) in 6.2×10^4 micrograms (μg).

Cubed Units

1. How many cubic meters (m^3) are there in 4312 cubic centimeters (cm^3)?
2. How many cubic decimeters (dm^3) are there in 1.733×10^5 cubic meters (m^3)?
3. Calculate the number of cubic centimeters (cm^3) in 16 cubic meters (m^3).
4. How many cubic kilometers (km^3) are there in 4.261×10^4 cubic meters (m^3)?
5. The volume of a sample of water is found to be 86.3 cubic centimeters (cm^3). What is the volume of the sample in cubic millimeters (mm^3)?

Volume

1. Convert 17.3 cm^3 to L.
2. Convert 565 deciliters (dL) to dm^3 .
3. Convert 3.0 dm^3 to mL.
4. Convert 45 L to cm^3 .

Derived Units

1. Convert 67 g/cm^3 to kg/dm^3 .
2. Convert 18.8 m/s to cm/s
3. Convert 143 km/hr to m/s.