

16)  $7.4 \times 10^{-5}$  0.000074

#### Unit Conversions

- 1) How many inches are there in 45.6 cm? (There are 2.54 cm in 1 inch) 18 inches
- 2) How many centimeters are there in  $1.23 \times 10^{-6}$  kilometers? 0.123 cm
- 3) How many hours are there in 34.5 years?  $3.02 \times 10^5$  hours
- 4) How many inches are there in 355 millimeters? 14 inches
- 5) How many milliliters are in a cubic meter? (There are 1,000 L in  $1 \text{ m}^3$ )  $1.00 \times 10^6$  ml
- 6) How many miles are there in  $3.44 \times 10^8$  inches? There are 0.61 miles in 1 km).  $5.33 \times 10^3$  miles

#### Density

1. A 5-ml sample of water has a mass of 5 g. What is the density of water? 1 g/ml
2. The density of aluminum is 2.7 g/ml. What is the volume of 8.1g? 3.0 ml

#### Percent error

1. The accepted density for copper is 8.96 g/ml. Calculate the percent error for each of the following measurements.
  - a. 8.86 g/ml 1.12%
  - b. 8.92 g/ml 0.446%
  - c. 9.00 g/ml 0.446%
  - d. 8.98 g/ml 0.223%

### Chapter 3

#### Properties of matter

##### Physical properties

##### Chemical properties

##### Physical changes

##### Chemical changes

#### Law of conservation of mass

#### Mixtures

##### Heterogeneous

##### Homogeneous

#### Methods to separate mixtures

#### Elements

#### Compounds

#### Law of definite proportions

#### Percent by mass

#### Law of multiple proportions

#### Practice problems

#### Conservation of mass

1. A 28.0 g sample of nitrogen gas combines completely with 6.0 g of hydrogen gas to form ammonia. What is the mass of ammonia formed? 34.0 g
2. A 13.0 g sample of X combines with a 34.0 g sample of Y to form the compound XY. What is the mass of the reactants? 47.0 g

#### Law of definite proportions

1. A 25.3 g sample of an unknown compound contains 0.8 g of oxygen. What is the percent by mass of oxygen in the compound? 3%
2. Magnesium combines with oxygen to form magnesium oxide. If 10.57 g of magnesium reacts completely with 6.96 g of oxygen, what is the percent by mass of oxygen in the magnesium oxide? 39.7%

#### Law of multiple proportions

1. Carbon reacts with oxygen to form two different compounds. Compound I contains 4.82 g carbon for every 6.44 g of oxygen. Compound II contains 20.13 g carbon for every 53.7 g of oxygen. What is the ration of carbon to a fixed mass of oxygen for the two compounds.

Compound I 0.748:1

Compound II 0.375:1

### Chapter 4

#### Structure of the atom

#### Development of the modern model of the atom

#### Atomic number

#### Mass number

#### Symbol and hyphen notation

#### Isotopes

##### Calculate average atomic mass

#### Nuclear reactions

##### Types of radiation

#### Practice problems

Fill in the blanks in the following worksheet. Please keep in mind that the isotope represented by each space may NOT be the most common isotope or the one closest in atomic mass to the value on the periodic table.