

CHEM 1094

SIG FIGS, DENSITY, AND CONVERSIONS

- Write the following in the exponential notation.
 - 12500 _____
 - 0.0062 _____
- How many significant figures are shown in each of the following?
 - 98.6 m _____
 - 0.0033 g _____
 - 7.02 mL _____
 - 7000 km _____
- Express each of the following to the number of significant figures indicated.
 - 3984.6 (3) _____
 - 186000 (4) _____
 - 422.04 (2) _____
 - 0.406 (1) _____
- Perform the following calculations and express your answer in exponential form and with the appropriate number of significant figures.
 - $320 \times 24.9 / 0.080 =$ _____
 - $(8.002 + 0.3040) / (13.4 - 0.066 + 1.02) =$ _____
- Perform the following conversions.
 - 642 kg to mg _____
 - 0.086 cm to nm _____
 - 495 m to yards (1 ft = 12 in, 1 in = 2.54 cm, 3 ft = 1 yd)

 - 13.6 g/mL to kg/ m³ _____
 - 234 °C to °F _____
 - 97.4 °C to K _____

6. 2.18 L sample of butyric acid, a substance present in rancid butter, has a mass of 2088 g. What is the density of butyric acid in g/mL?
(0.9578g/mL)
7. A solution consisting of 8.50% acetone-91.5% water, by mass, has a density of 0.9867 g/mL. What mass of acetone, in kilograms, is present in 7.50 L of the solution? **(629 g)**
8. A fertilizer contains 21% nitrogen by mass. What mass of this fertilizer, in kilograms, is required for an application requiring 775 g of nitrogen?
(3.69 Kg)
9. The density of aluminum is 2.70 g/cm³. A square piece of aluminum foil, 9.0 in. on a side, is found to weigh 2.568 g. What is the thickness of this foil, in millimetres? **(0.0182 mm)**
10. A water solution containing 12.0% sodium hydroxide by mass has a density of 1.131 g/mL. What volume of this solution, in litres, must be used in an application requiring 3.50 kg of sodium hydroxide? **(2.58L)**
11. The diameter of metal wire is often referred to by its wire gauge number. A 16-gauge wire has a diameter of 0.05082 in. What length of wire, in metres, is there in a 1.00-lb spool of 16-gauge copper wire? The density of copper is 8.92 g/cm³. **(38.9m)**
12. Water analysts often report trace impurities in water as parts per million. Think of 1 ppm as being 1 g of impurity per million grams of water. A swimming pool whose dimensions are 20.0 m x 50.0 m x 9.0 m has 15.0 lbs of chlorine added as a disinfectant. How many ppm of chlorine are present in this pool. Assume that density of pool water is 1.00 g/mL.
(0.757 ppm)
13. A balloon is filled with helium gas. Density of helium is 0.177 g/L. The diameter of the balloon is 1.00 foot. What is the mass in pounds of helium in the balloon. Ignore the thickness of the balloon. **(0.0462 pounds)**

