

## CHM 100

### Worksheet #1

Use dimensional analysis to solve each of the following problems.

1. Convert 14 mm to its equivalent measurement in m.
2. Convert 35 kg to its equivalent measurement in g.
3. Convert 57 ml to its equivalent measurement in L.
4. Convert a speed of 88 meters per second to its equivalent in centimeters per second.
5. Convert a density of 9.45 g/L to its equivalent measurement in g/ml.
6. What is the density of silver if a solid ingot has a volume of  $50 \text{ cm}^3$ , and a mass of 525 g?
7. The density of mercury metal is 13.6 g/ml. What is the mass of 3.55 ml of the metal?
8. The density of helium gas is 0.178 g/L. What is the volume of 375.0 g of this gas?
9. The density of salt (sodium chloride) is 2.16 g/ml. What is the mass of 100.0 ml of this solid?
10. A particle moves through a gas at a speed of 15 km/second. How far will it move in 5.5 sec.?
11. A mole of copper contains  $6.02 \times 10^{23}$  copper atoms. How many atoms are there in 0.525 moles?
12. The density of a barium nitrate solution is 61.2 g per liter of solution. How many grams of barium nitrate is contained in 2.75 L of this solution?
13. A sample of sea water contains 0.00245 g of sodium chloride per ml of solution. How much sodium chloride is contained in 50.0 ml of this solution?
14. Convert 15.9 mm to its equivalent measurement in km.
15. Convert 0.0982 g to its equivalent measurement in mg.
16. Convert 13,455 g to its equivalent measurement in kg.
17. Convert a speed of 73.5 km per hour to its equivalent in meters per second.
18. A particle moves through air at a speed of 5.0 km/second. How far would it move in 9.5 seconds?
19. Convert a density of 4.52 g/ml to its equivalent measurement in kg/L.
20. What is the density of a solid if it has a volume of  $20 \text{ cm}^3$ , and a mass of 190 g?
21. The density of lead is  $11.3 \text{ g/cm}^3$ . What is the mass of  $45 \text{ cm}^3$  of this metal?
22. The density of iron is  $7.86 \text{ g/cm}^3$ . What is the volume of 50.00 g of this metal?
23. A sample of sea water contains 6.277 g of sodium chloride per liter of solution. How many mg of sodium chloride would be contained in 15.0 ml of this solution?
24. A mole of sodium atoms contains  $6.02 \times 10^{23}$  atoms. How many moles would be needed in order to have  $25.0 \times 10^{23}$  atoms?
25. A sample of sea water contains 0.075 g of sodium chloride per ml of solution. How many moles of sodium chloride are there per liter of solution? A mole of sodium chloride is equal to 58.5 g of sodium chloride.
26. A mole of hydrogen atoms contains  $6.02 \times 10^{23}$  hydrogen atoms, and occupies 22.4 L. How many hydrogen atoms are there in 25 ml of this gas?