SCH 4U

**REVIEW OF GRADE 11 CONCEPTS FOR UNIT 3**

1. Express the following numbers in scientific notation. Refer to p.778 in text for help.
2. 367.8 b) 0.0002100 c) 7000 d) 7001
3. How many significant digits are in each of the following numbers?
4. 655 b) 23000 c) 0.0008810 d) 40.0
5. Calculate the answer to the following calculations using significant digits.
6. 3.784 b) 4.063×6.9 c) 23 + 4.1 + 0.75 d) 14÷978.6
7. What is the molar mass of calcium chloride, CaCl2? Use significant digits.
8. The symbols used for mole calculations are shown on p.809, 811. Basic mole calculations involve the following equations: $n=\frac{m}{M}$ $n=\frac{N}{N\_{A}}$ $n=\frac{C}{V}$
9. What is the mass of 0.337 mol CaCl2?
10. What amount of moles is 9.452×1024 formula units of CaCl2?
11. What volume of 0.0775 mol/L CaCl2 solution contains 0.150 mol of CaCl2?
12. Stoichiometry steps are on p.809.

When solid sodium hydrogen carbonate is added to aqueous sulfuric acid, carbon dioxide gas is produced. The skeleton equation is:

NaHCO­3(s) + H2SO4(aq) → Na2SO4(aq) + H2O(l) + CO2(g)

1. Balance the equation.
2. If 8.0 mol of NaHCO3 are added to the acid, how many moles of sodium sulfate are produced?
3. If 137.2 g of Na2SO4 are produced, what mass of NaHCO3 was used?
4. Recall that ionic compounds dissociate when they dissolve in water. For example, magnesium hydroxide crystals become magnesium ions and hydroxide ions that are each surrounded by polar water molecules. Mg(OH)2(s) → Mg2+(aq) + 2OH−(aq)

Write the dissociation equations for each of the following:

1. KNO3 b) Li3PO4 c) Fe2(SO4)3
2. Recall that double displacement reactions can be written as net ionic equations. Any aqueous ionic compounds are written as separate ions. For example, the reaction

Ba(NO3)2(aq) + Na2SO4(aq) → BaSO4(s) + 2NaNO3(aq)

can be written as the ionic equation

Ba2+(aq) + 2NO3−(aq) + 2Na+(aq) + SO42−(aq) → BaSO4(s) + 2Na+(aq) + 2NO3−(aq)

 This becomes the net ionic equation

Ba2+(aq) + SO42−(aq) → BaSO4(s)

 when you remove the spectator ions, 2Na+(aq) + 2NO3−(aq) from the ionic equation.

 Write the following as ionic, then net ionic equations.

1. CuSO4(aq) + 2KOH(aq) → Cu(OH)2(s) + K2SO4(aq)
2. HNO3(aq) + NaOH(aq) → NaNO3(aq) + H2O(l)

Homework: p.810 #8a-d, 13; p.812 #13