

Name: _____

Chem 121
Test 2
Version A

You have 50 minutes to complete this 100 point test. Show all work for full credit. You may use a non-graphing, scientific calculator.

1. (5 pts) Identify each compound below as soluble (S) or insoluble (IS). (circle one)

- | | | | |
|-------------------------------|---|----|----|
| a. BaCl_2 | S | or | IS |
| b. Na_2SO_4 | S | or | IS |
| c. Cu_2CO_3 | S | or | IS |
| d. $\text{Cr}(\text{NO}_3)_3$ | S | or | IS |
| e. BaSO_4 | S | or | IS |

2. (5 pts) Identify each compound below as a strong acid (SA), a weak acid (WA), a strong base (SB) or a weak base (WB). (circle one)

- | | | | | |
|--------------------------------------|----|----|----|----|
| a. HCl | SA | WA | SB | WB |
| b. $\text{Ca}(\text{OH})_2$ | SA | WA | SB | WB |
| c. NH_3 | SA | WA | SB | WB |
| d. $\text{HC}_2\text{H}_3\text{O}_2$ | SA | WA | SB | WB |
| e. H_3PO_4 | SA | WA | SB | WB |

3. (15 pts) Write the complete, ionic and net ionic balanced equations for the reaction of iron(III) acetate with sodium carbonate. Don't forget to indicate the precipitate.

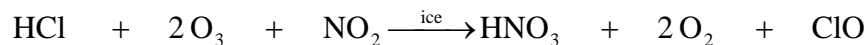
Complete: _____

Ionic: _____

Net Ionic: _____

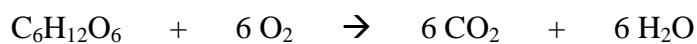
4. (10 pts) What is the molecular formula of a compound whose molar mass is 90.08 g/mol and whose empirical formula is CH_2O ?

5. (10 pts) Calculate the molar mass of cobalt(II) nitrate hexahydrate.
6. (10 pts) How many atoms of carbon are there in 15.0g C₆H₆? (MM of C₆H₆ = 78.11 g/mol)
7. (10 pts) Calculate the molar concentration of a solution made by dissolving 2.50 g NaCl in 350.0 mL of water. Assume the volume of the final solution is the volume of the water. (MM of NaCl = 58.44 g/mol)
8. (15 pts) It has been found that the depletion of the ozone layer near Antarctica is caused by the reaction of ozone (O₃) with chlorine containing molecules in the presence of stratospheric ice. How many grams of O₃ will be depleted if 15.0L of 1.50M HCl is allowed to react with excess NO₂? (MM of O₃ = 48.00 g/mol)



9. (5 pts) What volume (in mL) of 0.125 M K_2SO_4 is needed to make 250.0 mL of 0.0500 M K_2SO_4 ?

10. (15 pts) One of the most important reactions in the body involves glucose. In aerobic metabolism, glucose reacts with oxygen to form carbon dioxide and water. How many moles of carbon dioxide are formed from the reaction of 12.0 g $\text{C}_6\text{H}_{12}\text{O}_6$ with 12.0 g O_2 ? (MM of $\text{C}_6\text{H}_{12}\text{O}_6 = 180.16 \text{ g/mol}$, MM of $\text{O}_2 = 32.00 \text{ g/mol}$)



11. (10 pts) A 10.00 mL sample of phosphoric acid (H_3PO_4) was titrated with 25.86 mL of 0.750 M NaOH. Calculate the concentration of the phosphoric acid.

