

Chemistry 121
Spring 2004
Test 2
FORM A

Name: _____

Instructions: You have 75 minutes to complete this 100-point exam. You may use a simple scientific calculator. No programmable calculators allowed.

$$^{\circ}F = \left(\frac{9^{\circ}F}{5^{\circ}C} \right) (^{\circ}C) + 32^{\circ}F$$

$$^{\circ}C = \left(\frac{5^{\circ}C}{9^{\circ}F} \right) (^{\circ}F - 32^{\circ}F)$$

$$1 \text{ in} = 2.54 \text{ cm}$$

$$1000\text{g} = 1\text{kg}$$

$$1000 \text{ mg} = 1 \text{ g}$$

I. MULTIPLE CHOICE: (30 pts, 3 points each) Carefully and clearly circle the best answer. If you circle two answers, *one of which is correct*, you will receive 1 point.

- The correct chemical formula for sodium phosphate is:
 - SPO_4
 - S_3PO_4
 - NaPO_4
 - Na_3PO_4
- Which of these is NOT soluble in water?
 - NaCl
 - AgCl
 - BaCl_2
 - KCl
- In a balanced reaction, _____ are balanced.
 - molecules
 - moles
 - atoms
 - protons
- Which of the following is the net ionic reaction of $\text{Fe}(\text{NO}_3)_3$ with NaOH ?
 - $\text{Fe}(\text{NO}_3)_3 + 3 \text{NaOH} \rightarrow \text{Fe}(\text{OH})_3 (\text{s}) + 3 \text{NaNO}_3$
 - $\text{Fe}(\text{NO}_3)_3 + 3 \text{Na}^+ + 3 \text{OH}^- \rightarrow \text{Fe}(\text{OH})_3 (\text{s}) + 3 \text{Na}^+ + 3 \text{NO}_3^-$
 - $\text{Fe}^{3+} + 3 \text{NO}_3 + 3 \text{NaOH} \rightarrow \text{Fe}(\text{OH})_3 (\text{s}) + 3 \text{NaNO}_3$
 - $\text{Fe}^{3+} + 3 \text{OH}^- \rightarrow \text{Fe}(\text{OH})_3 (\text{s})$
- Which of the following will totally dissociate in water?
 - $\text{Fe}(\text{OH})_3$
 - LiOH
 - $\text{Cu}(\text{OH})_2$
 - $\text{Zn}(\text{OH})_2$

6. The point in a titration where the acid is exactly neutralized is called the:
- Neutral Point
 - Indicator Point
 - Standard Point
 - End Point
7. Sodium chloride (NaCl) is a(n):
- Electrolyte
 - Nonelectrolyte
 - Acid
 - Base
8. What are the products of a combustion reaction?
- C, H and O
 - C, H, O and N
 - CO and H₂O
 - CO₂ and H₂O
9. What are the correct stoichiometric coefficients to balance the following equation?
- $$\text{HNO}_3 + \text{Na}_2\text{CO}_3 \rightarrow \text{H}_2 + \text{CO}_2 + \text{NaNO}_3$$
- 2, 1, 1, 1, 2
 - 1, 1, 1, 1, 1
 - 2, 1, 1, 1, 1
 - 2, 2, 2, 1, 1
10. Which ion (if any) will react with sulfate ion to form a precipitate?
- Na⁺
 - K⁺
 - Ca²⁺
 - None of these

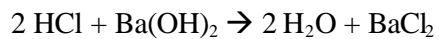
II. Short Answer and Calculations (80 pts): Clearly indicate your answer in the space provided. Partial credit will be given for correct work. If I cannot read the work, it will not be graded.

- (15 pts) Write the complete, total ionic and net ionic equations for the reaction of aqueous potassium iodide with aqueous silver (I) nitrate.
 - Complete
 - Total Ionic
 - Net Ionic
- (5 pts) Write the balanced reaction for the combustion of C₆H₁₄.

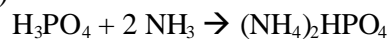
3. (10 pts) If 5.75 g of lithium carbonate is dissolved in enough water to make 0.500 L of solution, what is the molarity of lithium carbonate? (MM of $\text{Li}_2\text{CO}_3 = 73.893 \text{ g/mol}$)

4. (10 pts) How many milliliters of 5.0 M NaOH are required to make 100.00 mL of 0.200 M NaOH?

5. (15 pts) If 1.50 L of 0.125 M HCl is exactly neutralized by 3.00 L of $\text{Ba}(\text{OH})_2$, what is the molarity of the base?



6. (15 pts) Diammonium Phosphate (DAP) is a common component of fertilizer. $(\text{NH}_4)_2\text{HPO}_4$ is manufactured by the reaction of ammonia and phosphoric acid. How many grams of $(\text{NH}_4)_2\text{HPO}_4$ can be formed from 0.125 L of 0.25 M H_3PO_4 and 0.150 L of 0.15 M NH_3 . (MM of $(\text{NH}_4)_2\text{HPO}_4$ 132.055 g/mol)



7. (10 pts) What is the percent yield of a reaction that has an actual yield of 1.25 g and a theoretical yield of 8.75 g?