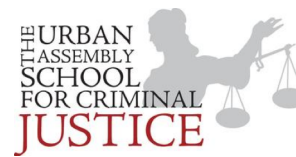


Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Chemistry** ~ Ms. Hart

**Class:** Anions or Cations



## Regents Review Day #1: Reference Tables Workout

### Directions:

\*Write the title of each reference table on the line. Complete the questions using each reference table and Table T, as needed. **For calculation questions, you MUST write the formula before substituting numbers**

### Table B: \_\_\_\_\_

|  |   |
|--|---|
| a. Calculate the heat released when 32 g of H <sub>2</sub> O(l) cools from 85°C to 50°C. | b. Calculate the energy needed to melt 50g of H <sub>2</sub> O(s) |
|  |   |

### Table C: \_\_\_\_\_

|                             |   |
|-----------------------------|---|
| a) Convert 352 mL to Liters | b) Calculate the molarity of a 440mL NaOH(aq) solution that contains 2.5 moles of NaOH. |
|                             |   |

### Table D: \_\_\_\_\_

a. Complete the table below

| Symbol | Name                             | Quantity | Write a formula from Table T that includes this unit |
|--------|----------------------------------|----------|--|
| K      |                                  |          |  |
| mol    |                                  |          |  |
| ppm    |                                  |          |  |
|        | Joule (in formulas as <b>q</b> ) |          |  |
| M      |                                  |          |  |

|   |   |
|---|---|
| b. What are the units for Molarity?<br>(Hint: Check the formula on Table T)<br><br>(1) moles<br>(2) L<br>(3) L/mol<br>(4) mol/L | c. Calculate the mass of O <sub>2</sub> in a 250g sample of water from the Bronx River that was measured to have 3ppm of O <sub>2</sub> . (See Table T) |
|---|---|

**Table E:** \_\_\_\_\_

1. Name the following compounds:

a)  $\text{NaSO}_4$  \_\_\_\_\_

b)  $\text{KCN}$  \_\_\_\_\_

c)  $\text{NH}_4\text{PO}_4$  \_\_\_\_\_

d)  $\text{MgNO}_3$  \_\_\_\_\_

2. Which is an **ionic** compound?  
(Hint: look for a polyatomic ion)

- (a)  $\text{Au}$  (b)  $\text{CO}_2$   
(c)  $\text{NH}_4\text{Cl}$  (d)  $\text{CH}_3\text{OH}$

3. Which is the correct chemical formula for iron (III) oxide?

- (a)  $\text{Fe O}$  (b)  $\text{Fe}_3 \text{O}_2$   
(c)  $\text{Fe}_2 \text{O}_3$  (d)  $\text{Fe O}_2$

**Table F:** \_\_\_\_\_

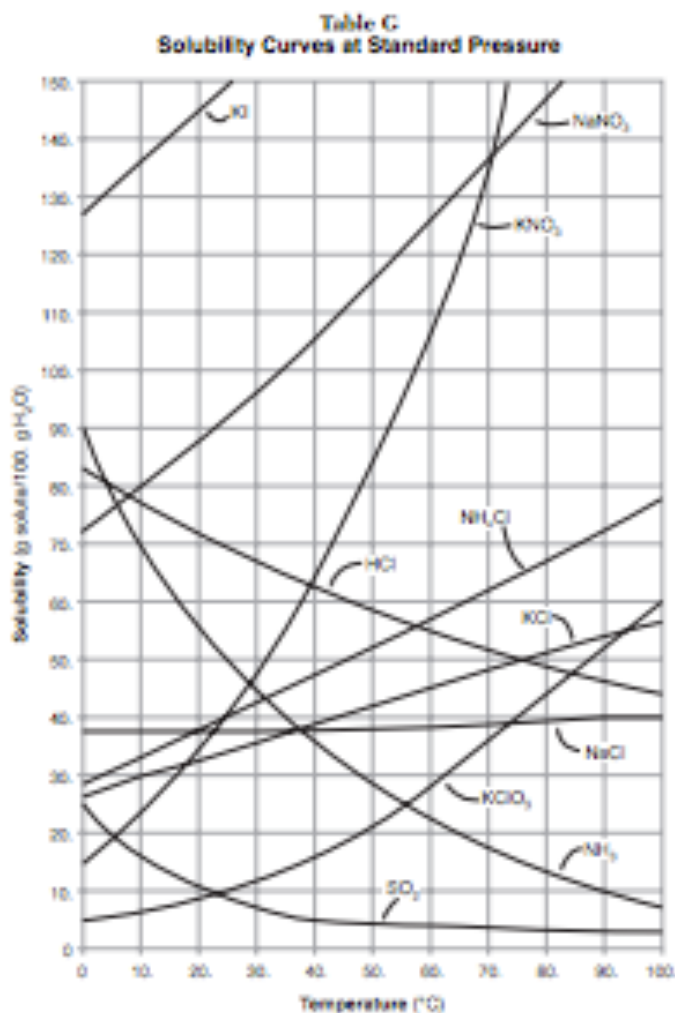
1. Which compound is **soluble** in water?

- (a)  $\text{AgCl}$  (b)  $\text{LiOH}$   
(c)  $\text{AgSO}_4$  (d)  $\text{MgOH}$

2. Which compound is **insoluble** in water?

- (a)  $\text{LiOH}$  (c)  $\text{NaCl}$   
(c)  $\text{PbCrO}_4$  (d)  $\text{LiPO}_4$

**Table G:** \_\_\_\_\_



1. How many grams of  $\text{SO}_2$  are needed to make a saturated solution in 100g of  $\text{H}_2\text{O}$  at  $30^\circ\text{C}$ ? \_\_\_\_\_ g

2. If you have 20 g of  $\text{NH}_3$  in 100g of water at  $50^\circ\text{C}$ , how many more grams do you need to make a saturated solution? \_\_\_\_\_ g

3. If you have 50g of  $\text{KCl}$  in 100g of water at  $40^\circ\text{C}$ , how many grams of precipitate remain undissolved? \_\_\_\_\_ g

4. How many grams of  $\text{KCl}$  are needed to make a saturated solution at  $20^\circ\text{C}$  in the each volume of water?

a) 100g  $\text{H}_2\text{O}$ : \_\_\_\_\_

b) 200g  $\text{H}_2\text{O}$ : \_\_\_\_\_

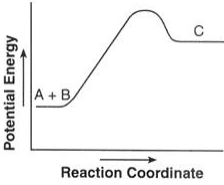
c) 50g  $\text{H}_2\text{O}$ : \_\_\_\_\_

**Table H:** \_\_\_\_\_

What is the boiling point of ethanoic acid if the atmospheric pressure is 90kPa? \_\_\_\_\_ °C

What is the boiling point of water at STP? \_\_\_\_\_ °C

**Table I:** \_\_\_\_\_

|   |  |   |
|---|--|---|
| <p>1. Which compound is formed from its elements in an <b>exothermic</b> reaction?<br/>(Use Table I, label + or -)</p> <p>(a) 2NO(g)<br/>(b) 2NO<sub>2</sub>(g)<br/>(c) 2NH<sub>3</sub>(g)<br/>(d) C<sub>2</sub>H<sub>4</sub></p> | <p>3. According to the graph below, which molecule could be the product? (Use Table I)</p>  <p>(a) 2CO<sub>2</sub><br/>(c) 2H<sub>2</sub>O</p> <p>(b) 2NO<br/>(d) 2NH<sub>3</sub></p> | <p>At 101.3 kPa and 298 K, what is the total amount of <b>heat released</b> when one mole of aluminum oxide, <b>Al<sub>2</sub>O<sub>3</sub>(s)</b>, is <b>formed from its elements</b>?<br/>(find this equation in Table I and look at the ΔH value.)</p> <p>(a) 393.5 kJ<br/>(b) 837.8 kJ</p> <p>(c) 1676 kJ<br/>(d) 3351 kJ</p> |
|---|--|---|

|  |   |
|--|---|
| <p><b>Table K:</b> _____</p> <p>1. Soda is a mixture of H<sub>2</sub>CO<sub>3</sub> and water, and has a pH of 5.</p> <p>When the cap is opened, the H<sup>+</sup> concentration decreases to 1/10 of the original amount.<br/>What is the new pH? _____</p> <p>2. Which substance yields (releases) H<sup>+</sup>(aq) as the only positive ion in an aqueous solution?</p> <p>(1) CH<sub>3</sub>CHO      (3) CH<sub>3</sub>COOH<br/>(2) CH<sub>3</sub>CH<sub>2</sub>OH      (4) CH<sub>3</sub>OCH<sub>3</sub></p> | <p><b>Table L:</b> _____</p> <p>1. What is the negative ion formed when KOH is mixed with water? _____</p> <p>2. Which choice is an <b>electrolyte</b>?</p> <p>a) O<sub>2</sub>      c) NaOH<br/>b) CH<sub>4</sub>      d) CO<sub>2</sub></p> |
|--|---|

**Table M:** \_\_\_\_\_

What color is methyl orange when it is placed in a solution with a pH of 9? \_\_\_\_\_

What color is litmus when it is placed in a solution with a pH of 1? \_\_\_\_\_

Which indicator is best to use to distinguish between two solutions with a pH of 7.0 and 10? \_\_\_\_\_ (the color change range must be between the pH values)

**Table N:** \_\_\_\_\_

- What is the decay mode of Fe-53? \_\_\_\_\_
- What is the nuclide name of the isotope with a half-life of 7.13s? \_\_\_\_\_
- Nyomi has a 120g sample of Cs-137. How many grams will remain after 3 half lives have passed?  
(Make a table or draw a picture)

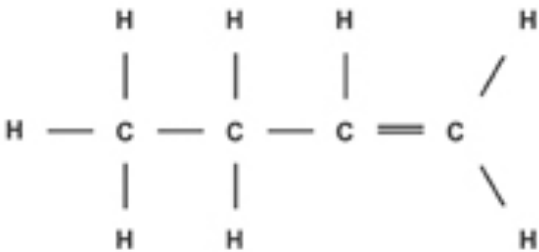
\_\_\_\_\_ g

**Table O:** \_\_\_\_\_

- What is the mass of a beta particle? \_\_\_\_\_
- Which particle has the greatest mass? (a)  $\alpha$ , alpha (b)  $\beta$ , beta (c)  $\delta$ , gamma
- Which particle has the greatest penetrating power? (a)  $\alpha$ , alpha (b)  $\beta$ , beta (c)  $\delta$ , gamma
- Write the equation for the alpha decay of Fr-220

\_\_\_\_\_  $\rightarrow$  \_\_\_\_\_ + \_\_\_\_\_

**Table P:** \_\_\_\_\_ **Table Q:** \_\_\_\_\_

|  |   |
|--|---|
| 1. Name the molecule in the box on the right.<br>(Based on the number of carbons and if there are single, double, or triple bonds) |  <p>Name: _____</p> |
| 2. To which <b>homologous series</b> does that molecule belong to?   |   |
| 3. What is the <b>general formula</b> of this compound?  |   |
| 4a) Is this saturated or unsaturated?  | a)  |
| 4b) Why?   | b)  |
| 5. Write the molecular and empirical formula of this compound  | Molecular Formula: _____<br>Empirical Formula: _____  |

**6. Calculate the Gram-Formula Mass of C<sub>4</sub>H<sub>8</sub>**

\_\_\_\_\_ grams/mol

**7. Calculate the % Composition of carbon in C<sub>4</sub>H<sub>8</sub> (see Table T for formula)**

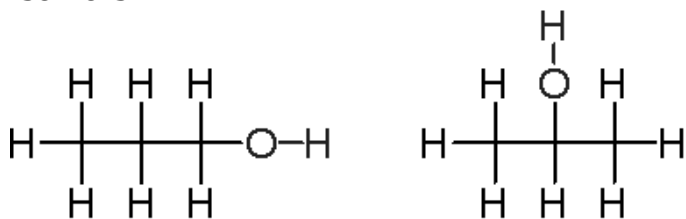
\_\_\_\_\_ %

**Table R:** \_\_\_\_\_

For each molecule, write the class of compound to which it belongs based on its functional group.

|                           |  |  |  |   |
|---------------------------|--|--|--|---|
| <b>Structural Formula</b> | $  \begin{array}{cccc}  \text{H} & \text{H} & \text{H} & \text{H} \\    &   &   &   \\  \text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{OH} \\    &   &   &   \\  \text{H} & \text{H} & \text{H} & \text{H}  \end{array}  $ | $  \begin{array}{ccccccc}  \text{H} & \text{H} & \text{H} & \text{O} & & & \\    &   &   &    & & & \\  \text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{N} & & \text{H} & & & & \\    &   &   & & & & \\  \text{H} & \text{H} & \text{H} & & & &   \end{array}  $ | $  \begin{array}{ccc}  \text{H} & \text{O} & \\    &    & \\  \text{H}-\text{C}-\text{C}-\text{OH} \\    & & \\  \text{H} & &   \end{array}  $ | $  \begin{array}{ccc}  \text{H} & \text{O} & \text{H} \\    &    &   \\  \text{H}-\text{C}-\text{C}-\text{C}-\text{H} \\    & &   \\  \text{H} & & \text{H}  \end{array}  $ |
| <b>Class of Compounds</b> |  |  |  |   |

|                           |   |   |  |  |
|---------------------------|---|---|--|--|
| <b>Structural Formula</b> | $  \begin{array}{c}  \text{O} \\     \\  \text{H}-\text{C}-\text{N}-\text{CH}_3 \\    \\  \text{CH}_3  \end{array}  $ | $  \begin{array}{ccc}  \text{H} & \text{O} & \\    &    & \\  \text{H}-\text{C}-\text{C}-\text{H} \\    & & \\  \text{H} & &   \end{array}  $ | $  \begin{array}{ccccccc}  \text{H} & \text{H} & \text{O} & & \text{H} & & \\    &   &    & &   & & \\  \text{H}-\text{C}-\text{C}-\text{C}-\text{O}-\text{C}-\text{H} \\    &   & & &   & & \\  \text{H} & \text{H} & & & \text{H} & &   \end{array}  $ | $  \begin{array}{ccccccc}  \text{H} & \text{H} & & \text{H} & \text{H} & & \\    &   & &   &   & & \\  \text{H}-\text{C}-\text{C}-\text{O}-\text{C}-\text{C}-\text{H} \\    &   & &   &   & & \\  \text{H} & \text{H} & & \text{H} & \text{H} & &   \end{array}  $ |
| <b>Class of Compounds</b> |   |   |  |  |

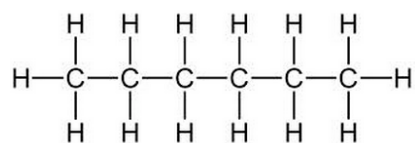
**Isomers**

1. Explain, in terms of their molecular composition, one similarity and one difference between these isomers.

Similarity: \_\_\_\_\_

Difference: \_\_\_\_\_

2. State whether the hydrocarbon below is saturated or unsaturated and explain why.



4. What is the name of the molecule pictured above? \_\_\_\_\_

**Table S:** \_\_\_\_\_

|   |   |
|---|---|
| 1. Which element has the greatest density?<br>(a) H (b) Fe<br>(c) B (d) Br<br><br>2. Which element has the greatest attraction for electrons of another atom (electronegativity)?<br>(a) C (b) N<br>(c) H (d) F | 3. Which element is a <b>solid</b> at STP?<br><b>Hint: The Noble Gases (Group 18) and the diatomic gases (H<sub>2</sub>, He<sub>2</sub>, O<sub>2</sub>, N<sub>2</sub>, Cl<sub>2</sub>, Br<sub>2</sub>, F<sub>2</sub>), are all gases at STP</b><br>(a) Kr (b) B<br>(c) Cl <sub>2</sub> (d) Xe<br><br>4. Which molecule has the most polar bond?<br><b>(Hint: Which atom bonded to H has the greatest electronegativity value)</b><br>(a) HN (b) HCl<br>(c) HBr (d) HF |
|---|---|

**Table A:** \_\_\_\_\_

|  |   |
|--|---|
| A sample of gas is at 2atm pressure, 300K, and takes up 4.5L of space. Find the volume of the gas when it is changed to STP.<br><b>(Use both Table A and Table T, Combined Gas Law Formula)</b><br><br>P <sub>1</sub> = P <sub>2</sub> =<br>V <sub>1</sub> = V <sub>2</sub> =<br>T <sub>1</sub> = T <sub>2</sub> = | <b>Write Combined Gas Law Formula and solve</b> |
|--|---|

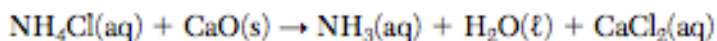
**Regents Short Answer Practice**

\*\*\*READ THE QUESTIONS BELOW AND THEN READ THE PASSAGE AFTERWARDS

Base your answers to questions 66 through 70 on the information below and on your knowledge of chemistry.

Baking soda, NaHCO<sub>3</sub>, can be commercially produced during a series of chemical reactions called the Solvay process. In this process, NH<sub>3</sub>(aq), NaCl(aq), and other chemicals are used to produce NaHCO<sub>3</sub>(s) and NH<sub>4</sub>Cl(aq).

To reduce production costs, NH<sub>3</sub>(aq) is recovered from NH<sub>4</sub>Cl(aq) through a different series of reactions. This series of reactions can be summarized by the overall reaction represented by the unbalanced equation below.



- Write a chemical name for baking soda. (utilize Table E for help) \_\_\_\_\_
- State the color of **bromocresol green** in a sample of NH<sub>3</sub>(aq) \_\_\_\_\_  
(hint: use tables K and L to see if NH<sub>3</sub> is an acid or a base)
- Balance the equation below for the overall reaction used to recover NH<sub>3</sub>(aq), using the smallest whole-number coefficients.

