| 고 있는 생생님이 있는 것이 되었다. 그는 것이 되었다. 그는 것이 되었다는 것이 되었다는 것이 되었다는 것이 되었다는 것이 되었다. 그는 것이 되었다는 것이 되었다는 것이 되었다.<br>그는 사람들은 사람들은 그는 것이 되었다는 것이 되었다면 되었다면 되었다면 되었다면 되었다면 되었다면 되었다면 되었다면  |
|--|
| Quiz III General Chemistry II Lecture B Dr. Hahn 20 pts 2/20/13 W 9:30 am quiz #   |
| Name (print) Name (sign)   |
| Please show all work for full credit & to get partial credit. (suggestion: A guess is better than no answer.)  |
| 1. How many grams of KI is dissolved in 30.5 mL of a 0.255 M water solution? (FW KI = 165.9)   |
| g/mol) (6 pts) (2pt) (math 1)  |
| 105 mex 0.27 March x 165,99 KZ 21,299  |
| 1005 ml x 0.295 molkI x 165,99 kI = 1,299  1000 mlkI ImalkI kI   |
| 2. In freezing point depression and boiling point elevation, if you use Mg Cl <sub>2</sub> as the dissolved  |
| substance, assuming complete dissociation, what is the i (Van't Hoff factor)? (3 pts)  |
| my Cl2 -) mg +2 Cl 3 particles   |
| 3. For the following reaction mechanism shown as the elementary reactions given, what is the rate law?  (You do not need to show me only reactants of the overall reaction to complete this problem. You do        |
| not need to show me the overall reaction to complete this problem.) (5 pts)  |
| $Br_2 \xrightarrow{k_1} 2 Br$ fast elementary reactions of the proposed reaction mechanism $-\frac{k_1}{2}$  |
|  |
| Br + H2 HBr + H slow Vate = h2 (h2)  |
| $H + Br_2 \rightarrow HBr + Br fast$   |
| Br + H <sub>2</sub> \rightarrow HBr + H slow rate = h <sub>2</sub> (hr) (H <sub>2</sub> ) H + Br <sub>2</sub> \rightarrow HBr + Br fast \rightarrow rate from the 5/000 step  rate law is only from the 5/000 step |
| (vato fa-a)/orallRy 1 27) (added -2)   |
| Cole of or all the second  |
| 4. For the following energy vs. reaction progress diagram, match the blanks with the appropriate terms.  (a) reactant (b) product (c) transition state (d) intermediate (Each term may be used once, more than     |
| once or not at all) (6 pts)  |
| sout)  |
| (rate 2-1-2-1-2-1-2-1-2-1-2-1-2-1-2-1-2-1-2-1  |
|  |
| ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )  |
| $Energy$ (a) $A \leftarrow A \leftarrow A \rightarrow $  |
|  |
| reaction progress  |
| Extra Credit: For the reaction shown, what is the rate of the reaction written in the form $\Delta [A]/\Delta t$ for   |
| the molecule CO <sub>2</sub> Don't forget the correct sign of the equation. (3 pts)  |
| $2 \operatorname{COF}_2 \to \operatorname{CO}_2 + \operatorname{CF}_4 \qquad \qquad \operatorname{rate} = \qquad + \left( \begin{array}{c} + \\ - \end{array} \right) $  |
| wrong molecule - 12) ( A &   |
| (or general & SA)  |

| Quiz III General Chemistry II Lecture A Dr. Hahn 20 pts 2/20/13 W 11:30 am quiz #  |
|--|
| Name (print) Name (pad other pt -4) (sign)   |
| Name (print) Name (sign)  Please show all work for full credit & to get partial credit. (suggestion: A guess is better than po answer.)  |
| mash 1) (20t) X2pt)  |
| 1. What is the molality of a solution made by dissolving 22.7 grams of ethanol (FW ethanol = 46.08   |
| g/mol) in 355 grams of water (assume density water = 1.00 g/1.00 mL)? (6 pts)  |
| molality = $\frac{1}{160000}$ to $\frac{1}{1600000}$ $\frac{1}{160000000000000000000000000000000000$   |
|  |
| 2. In freezing point depression and boiling point elevation, if you use Ca (OA)2 as the dissolved  |
| substance, assuming complete dissociation, what is the i (Van't Hoff factor)? (3 pts)  |
| Ca(OH)2 -> Ca+2+2OH 3 particles (2PA)  |
| 3. For the following reaction mechanism shown as the elementary reactions given, what is the rate law?  (You do not need to show me only reactants of the overall reaction to complete this problem. You do  |
| not need to show me the overall reaction to complete this problem ) (5 pts)  |
| $I_2 \rightarrow 2I$ fast bad attempt elementary reactions of the proposed reaction mechanism  |
|  |
| vates backs  |
| $H_2 + 2I \stackrel{?}{\underset{\sim}{\longrightarrow}} 2HI \text{ slow} \qquad Vate > ln_2 (-ln_2) (-$ |
| only rate detarning step determines rate (only rate detarning step (vote for overall RXN-21)   |
| That for Overest 7 22  |
| <ul><li>4. For the following energy vs. reaction progress diagram, match the blanks with the appropriate terms.</li><li>(a) reactant (b) product (c) transition state (d) intermediate (Each term may be used once, more than</li></ul>  |
| once or not at all) (6 pts) $(aA + bB \rightarrow CC + dD)$  |
| (aft + bir / Clauf   |
| 200 ) ( ) (A) - (A) - (A)  |
| ant d (roue a to b st  |
|  |
| 150 - LACO - LACO  |
| 1 - C st dat   |
| Energy   |
| reaction progress  |
|  |
| Extra Credit: For the reaction shown, what is the rate of the reaction written in the form $\Delta [A]/\Delta t$ for   |
| the molecule BrNO Don't forget the correct sign of the equation. (3 pts)   |
| $2 \text{ BrNO} \rightarrow 2 \text{ NO} + \text{Br}_2$ rate = ( - \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \   |
| (I) YOU LOCA)  |
| ( # -1) ( a Oi)  |
|  |

| Quiz III   | General Chemistry II                                    | Lecture B Dr.  | Hahn 20 pts                     | 2/20/13 W 11:                                  | 30 am quiz#                     | <u> </u>                                 |
|------------|---|--|---------------------------------|--|---------------------------------|--|
| Name       | Key   | 6  | print) Name                     |  |                                 | (sign)                                   |
|            | how all work for full c                                 | redit,& to get parti   | al credit. (sug                 | gestion: A gues                                | s is better than no a           |  |
| 1 1        | What is the molarity of                                 | then -   | v dissolving 78                 | 7 grams of met                                 | hanol (FW methano               | ol = 32.05                               |
| <b>_</b>   | g/mol) in 355 grams (                                   | of water (assume   | density water =                 | 1.00 g / 1.00 ml                               | (6 pts)                         | en e |
| M = :      | # moles some  | te) s#moly   | es = 18.1.                      | $g \times \frac{1 \text{ mos}}{21 \text{ ac}}$ | $\leq 2.46$                     | mdes                                     |
|            | Eggsolvert  | / 11 (   | 2pt) ]                          | クレレフ   | 2 16 1                          | reon                                     |
| #100       | $= 3553 \times $ In freezing point depre                | 10000  | = 0.100 K                       | 8 M=   | 2146mole                        | 26.43 m                                  |
| 7 2. 2     | In freezing point depre                                 | ession and boiling   | point elevation,                | if you use Ca C                                | l <sub>2</sub> as the dissolved | substance,                               |
|            | assuming complete disa                                  |  |                                 |  | pts)                            |  |
|            | all -   |  |                                 |  |                                 |  |
| e i di     | For the following react You do not need to she          | MALE TO TAKE THE RESERVE AND THE |                                 |  | <del>-</del>                    | 1.0                                      |
|            | not need to show me th                                  |  | もがた たんない アー・ス・アナイだい こうごうしん      |  |                                 |  |
| $O + N_2$  | NO + N slow   | elementary rea   | ctions of the pro               | posed/reaction                                 | mechanism                       |  |
| Cl + F     | $I_2 \rightarrow HCl + H fast$                          | ) 100to =  | 0. F                            | 375 M  | 7 (bad                          | -3)                                      |
| (4)<br>(4) | ~   | 100  |                                 |  | att                             | empt)                                    |
| Vat        | $\begin{array}{c}                                     $ | y deple  | ds or                           | 510w.  | stop -                          |  |
| (          | YOUR DON ON   | 10NUV PXY  | ルーレン                            |  |                                 |  |
| 4. I       | For the following energy<br>eactant (b) product (c)     | y vs. reaction prog  | gress diagram, n                |  |                                 |  |
|            | once or not at all) (6 pt                               | <u>s)</u> . •  | <b>/</b>                        | (at + b  | - <b>71</b>                     | ~ ^ ^                                    |
|            | 12 ptem   | $\frac{1}{2}$  | <b>9</b>                        |  | [A]                             | rav                                      |
| egreen.    |   | The T  | $\overline{}$ $\mathcal{A}_{0}$ | Vote 2   | 1 2(A)                          | -494                                     |
|            |   | レギ   |                                 | $\Lambda$                                      |                                 | 5 DE                                     |
|            |   |  |                                 | \2   | <u> </u>                        | , <u>ala</u>                             |
|            |   | V. Tr  | 3)                              |  | · Dt o                          | 126/                                     |
|            | Energy (Q)  |  | -)<br>-2                        |  | <b>&gt;</b>                     |  |
|            |   |  |                                 |  |                                 |  |
|            | reaction  | progress   |                                 |  |                                 |  |
| - 10 0 0   | a Credit: For the react nolecule NO Don't               |  |                                 | tion (3 pts)                                   | in the form $\Delta [A]$        | <b>I</b> /Δ1 for                         |
| 2 Br       | $NO \rightarrow 2 NO + Br_2/$                           | wrung  | rate = (                        | 구쇳   | $\frac{N_0}{2}$                 | of which                                 |
|            |   | #1/  |                                 |  |                                 | ( )                                      |
|            |   | ノン   |                                 | 11/1   | · //a7 /                        |  |
|            |   |  |                                 | (12/a  |                                 |  |
| 4.23       |   |  | turk Mily                       |  |                                 |  |

| Quiz III | General Chemistry II Lecture A | Dr. Hahn | 20 pts | 2/20/13 W | 9:30 am | quiz # <u> </u> |
|----------|--------------------------------|----------|--------|-----------|---------|-----------------|
| •        | <del>-</del>                   |          |        |           |         |                 |

Name \_\_\_\_\_\_(print) Name \_\_\_\_\_\_(sign)

Please show all work for full credit & to get partial credit. (suggestion: A guess is better than no answer.)

- 1. How many grams of NaCl is dissolved in 30.5 mL of a 0.100 M water solution? (FW NaCl = 58.5 g/mol) (6 pts)
- 2. In freezing point depression and boiling point elevation, if you use FeCl<sub>3</sub> as the dissolved substance, assuming complete dissociation, what is the i (Van't Hoff factor)? (3 pts)
- 3. For the following reaction mechanism shown as the elementary reactions given, what is the rate law? (You do not need to show me only reactants of the overall reaction to complete this problem. You do not need to show me the overall reaction to complete this problem.) (5 pts)

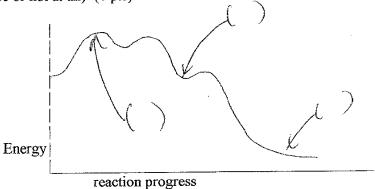
$$C1 + O_3 \rightarrow C1O + O_2$$

$$C1O + O \rightarrow C1 + O_2$$

$$K_2$$

fast step elementary reactions of the proposed mechanism slow step

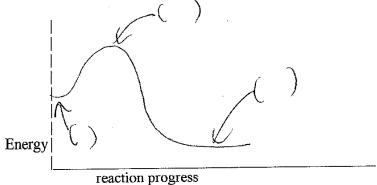
4. For the following energy vs. reaction progress diagram, match the blanks with the appropriate terms.
(a) reactant (b) product (c) transition state (d) intermediate (Each term may be used once, more than once or not at all) (6 pts)



Extra Credit: For the reaction shown, what is the rate of the reaction written in the form  $\Delta [A]/\Delta t$  for the molecule  $COF_2$  Don't forget the correct sign of the equation. (3 pts)

$$2 \text{ COF}_2 \rightarrow \text{ CO}_2 + \text{ CF}_4$$

| Name Please show all work for full   | (print) Name credit & to get partial credit. (suggestion: A gue   | (sign) (ss is better than no answer)                      |
|--|---|---|
| 1. How many grams of g/mol) (6 pts)  | KI is dissolved in 30.5 mL of a 0.255 M water so  | olution? (FW KI = 165.9                                   |
| 2. In freezing point dep substance, assuming                                 | ression and boiling point elevation, if you use Months of the Months of | g Cl <sub>2</sub> as the dissolved ctor)? (3 pts)         |
| (You do not need to s<br>not need to show me                                 | ction mechanism shown as the elementary reaction how me only reactants of the overall reaction to complete this problem.) (5  | omplete this problem. You do pts)                         |
| Br₂ ≯ 2 Br<br>← <b>k</b> -1  | fast elementary reactions of the proposed reacti  | on mechanism  |
| Ka Ka  |   |   |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$                         | fast  |   |
|  |   |   |
| 4. For the following energy (a) reactant (b) product (once or not at all) (6 | ergy vs. reaction progress diagram, match the blank<br>c) transition state (d) intermediate (Each term may<br>pts)  | cs with the appropriate terms.  y be used once, more than |



Extra Credit: For the reaction shown, what is the rate of the reaction written in the form  $\Delta [A]/\Delta t$  for the molecule  $CO_2$  Don't forget the correct sign of the equation. (3 pts)

 $2 \text{ COF}_2 \rightarrow \text{ CO}_2 + \text{ CF}_4$ 

rate = \_\_\_\_\_\_

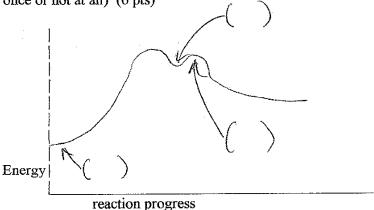
|                                    | General Chemistry II  |                                    |                                 |                        |                          |                                  |   |    |
|------------------------------------|---|------------------------------------|---------------------------------|------------------------|--------------------------|----------------------------------|---|----|
| Name                               |   |                                    | (print) N                       | lame                   |                          |                                  | (sign)  |    |
| Please sh                          | ow all work for full cre  | edit & to get p                    | artial credit                   | t. (sugg               | gestion: A               | guess is be                      | etter than no answer.)                            |    |
| 1. V                               | What is the molality of a /mol) in 355 grams of                             | solution mad                       | e by dissol                     | ving 22.               | 7 grams of               | ethanol (F                       | W ethanol = 46.08                                 |    |
| 2. I                               | in freezing point depres<br>abstance, assuming cor                          | ssion and boili<br>nplete dissocia | ng point ele<br>tion, what      | evation,<br>is the i ( | if you use<br>(Van't Hof | Ca (OH) <sub>2</sub> f factor) ? | as the dissolved (3 pts)                          |    |
| n                                  | or the following reaction  You do not need to shout to shout to show me the | w me only rea                      | ctants of th                    | e overal               | l reaction               | to complete                      | n, what is the rate law<br>e this problem. You do | ?  |
| $I_2 \stackrel{5}{\Rightarrow} 2I$ | fast  | ele                                | nentary rea                     | ections o              | f the prope              | sed reaction                     | on mechanism                                      |    |
| - K-1                              |   |                                    | ,                               |                        |                          |                                  |   |    |
| •                                  |   |                                    |                                 |                        |                          |                                  |   |    |
| $H_2 + 2$                          | I → 2 HI slow   |                                    |                                 |                        |                          |                                  |   |    |
|                                    | <b>-1</b>   |                                    |                                 |                        |                          |                                  |   |    |
|                                    |   |                                    |                                 |                        |                          |                                  |   |    |
| (a) r                              | for the following energy<br>eactant (b) product (c) or not at all) (6 pts)  | y vs. reaction transition state    | orogress dia<br>(d) interm      | agram, r<br>nediate (  | natch the b<br>Each term | olanks with<br>may be use        | the appropriate terms<br>ed once, more than       | ļ. |
|                                    |   |                                    |                                 |                        |                          |                                  |   |    |
| r                                  | Zm omous l  |                                    |                                 |                        |                          |                                  |   |    |
| £                                  | Energy  | :                                  |                                 |                        |                          |                                  |   |    |
|                                    | reaction  | progress                           |                                 |                        |                          |                                  |   |    |
|                                    | ,   |                                    |                                 |                        |                          |                                  |   |    |
|                                    | a Credit: For the react nolecule <b>BrNO</b>                                | ion shown, wh<br>Don't forget t    | nat is the rather the correct : | te of the<br>sign of t | reaction whe equation    | vritten in th<br>n. (3 pts)      | the form $\Delta[A]/\Delta t$ for                 | T  |
| 2 Br                               | $NO \rightarrow 2NO + Br_2$   |                                    | rate                            | e =                    |                          |                                  |   |    |

.

- 1. What is the molality of a solution made by dissolving 78.7 grams of methanol (FW methanol = 32.05 g/mol) in 355 grams of water (assume density water = 1.00 g/1.00 mL)? (6 pts)
- 2. In freezing point depression and boiling point elevation, if you use Ca Cl<sub>2</sub> as the dissolved substance, assuming complete dissociation, what is the i (Van't Hoff factor)? (3 pts) \_\_\_\_\_
- 3. For the following reaction mechanism shown as the elementary reactions given, what is the rate law? (You do not need to show me only reactants of the overall reaction to complete this problem. You do not need to show me the overall reaction to complete this problem.) (5 pts)

$$O + N_2 \xrightarrow{k} NO + N$$
 slow elementary reactions of the proposed reaction mechanism  $C1 + H_2 \xrightarrow{k} HC1 + H$  fast

- 4. For the following energy vs. reaction progress diagram, match the blanks with the appropriate terms.
- (a) reactant (b) product (c) transition state (d) intermediate (Each term may be used once, more than once or not at all) (6 pts)



Extra Credit: For the reaction shown, what is the rate of the reaction written in the form  $\Delta [A] / \Delta t$  for the molecule **NO** Don't forget the correct sign of the equation. (3 pts)

 $2 \text{ BrNO} \rightarrow 2 \text{ NO} + \text{Br}_2$ 

| rate = |  |  |
|--------|--|--|
|        |  |  |