**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Unit 10: I Can Statements Kinetics and EQ** If you can do all the things listed below, you are ready for the Unit 12 test.

Place a checkmark next to each item that you can do! If a sample problem is given, complete it as evidence.

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| **\_\_\_\_\_1. I can define effective collision and collision theory** | **Definition:**  effective collision  collision theory |
| **\_\_\_\_\_2. I can state and apply the relationship between temperature and reaction rate in terms of collision theory.** | As the temperature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the reaction rate for most  chemical reactions \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because there are \_\_\_\_\_\_\_  effective collisions between particles.  Given the reaction:  2Mg(s) + O2(g) -----> 2MgO(s)  At which temperature would the reaction occur at the greatest rate?  A) 0oC B) 15oC C) 95oC D) 273K |
| **\_\_\_\_\_3. I can state and apply the relationship between surface area and reaction rate in terms of collision theory.** | As the surface area \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the reaction rate  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because there are \_\_\_\_\_\_\_\_\_\_\_\_ effective collisions between particles.  At STP, which 4.0 g sample of Zn(s) will react most quickly with dilute hydrochloric acid?  A) lump B) bar C) powdered D) sheet metal |
| **\_\_\_\_\_4. I can state and apply the relationship between concentration and reaction rate in terms of collision theory.** | As the concentration \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the reaction rate  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because there are \_\_\_\_\_\_\_\_\_ effective collisions between particles.  At 20oC, a reaction between powdered Zn(s) and hydrochloric acid will occur most quickly if the concentration of the HCl is  A) 1.0 M B) 1.5 M C) 2.5 M D) 2.8 M |
| **\_\_\_\_\_5. Based on the location of the energy term, I can determine if the reaction is exothermic or endothermic.** | Given the following balanced equation:  I + I -----> I2 + 146.3 kJ  Is this reaction exothermic or endothermic? Justify your answer. |
| **\_\_\_\_\_6. I can use Table I to determine if a reaction is exothermic or endothermic.** |  |
| **\_\_\_\_\_7. I can define potential energy diagram, reaction coordinate, PEreactant, PEproduct, heat of reaction (H), activation energy, catalyst.** | potential energy diagram  reaction coordinate  PEreactant  PEproduct  heat of reaction (H)  activation energy  catalyst  entropy |
| **\_\_\_\_\_8. Given a potential energy diagram, I can determine if the reaction is exothermic or endothermic.** | Give the potential energy diagram below, determine if the reaction is exothermic or endothermic. Justify your answer. |
| **\_\_\_\_\_9. Given a potential energy diagram, I can determine the PEreactant, PEproduct, H, and activation energy.** | Given the potential energy diagram below, determine the PEreactant, PEproduct, H, and the activation energy.    PEreactant = PEproduct =  H = activation energy = |
| **­­­­\_\_\_\_\_10. Given a potential energy diagram for an uncatalyzed reaction diagram, I can how the diagram will change when a catalyst is been added.** | Draw a dotted line on the potential energy diagram shown below to indicate how it will change if a catalyst is added. |
| **\_\_\_\_\_11. I can rank the three phases of matter from least entropy to most entropy.** | Least entropy Most entropy  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_<\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_<\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **\_\_\_\_\_12. I can state the trends in nature for entropy and energy.** | In nature most systems in nature tend to undergo reactions that have a(n)  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in entropy and a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in energy. nature is like a teenager ---- lazy and messy! |
| **\_\_\_\_\_13. Given a balanced equation, I can determine if the reaction results in an overall increase or decrease in entropy.** |  |
| **\_\_\_\_\_14. I can define forward reaction, reverse reaction, reversible reaction, and closed system** | **Definitions:**  forward reaction  reverse reaction  reversible reaction  closed system |
| **\_\_\_\_\_15. I can state the three types of equilibrium.** | The three types of equilibrium are:  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ equilibrium  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ equilibrium and  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ equilibrium |
| **\_\_\_\_\_16. I can state two conditions that apply to all systems at equilibrium.** | In a system at equilibrium the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the forward and reverse reaction must be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the reactants and products must be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| **\_\_\_\_\_17. Given a list of reactions, I can identify reactions that show equilibrium (chemical, phase, or solution).** | Which balanced equation represents phase equilibrium?  A) H2(g) + I2(s) <-----> 2HI(g)  B) I2(s) <-----> I2(g)  H2O  Which balanced equation represents solution equilibrium?  A) H2(g) + I2(s) <-----> 2HI(g)  B) I2(s) <-----> I2(g)  H2O  C) KCl(s) <-----> KCl(aq)  D) 2KCl(s) + 3O2(g) -----> 2KClO3  Which balanced equation represents chemical equilibrium?  A) H2(g) + I2(s) <-----> 2HI(g)  B) I2(s) <-----> I2(g)  H2O  C) KCl(s) <-----> KCl(aq)  D) 2KCl(s) + 3O2(g) -----> 2KClO3 |
| **\_\_\_\_\_18. In terms of saturation, I can describe a solution that is at equilibrium.** | In terms of saturation, a solution that is at equilibrium must be  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| **\_\_\_\_\_19. I can state LeChatelier’s Principle.** | LeChatelier’s Principle states |
| **\_\_\_\_\_20. Given a balanced equation at equilibrium, I can predict the direction of shift in the equilibrium when the temperature, concentration, or pressure is changed or if a catalyst is added.** | Given the reaction at equilibrium:  2SO2(g) + O2(g) <-----> 2SO3(g) + 392kJ  Predict the direction of shift in the equilibrium (right, left, no shift) when the following changes are made to the system.   |  |  | | --- | --- | | **Change** | **Direction of Shift** | | Increase concentration of SO2 |  | | Increase concentration of SO3 |  | | Increase temperature |  | | Increase pressure |  | | Add a catalyst |  | |