AR Chemistry Review Set:
Molarity, Normality, Dilution, Breaking Compounds Apart.

1. What is the definition for Molarity?
2. What is the term for the material being dissolved into a solution?
3. What is the term for the material doing the dissolving in a solution?
4. You have a solution that is 25% water and 75% alcohol. What material is the solute?
5. You have a solution that is 25% water and 75% alcohol. What material is the solvent?
6. What is the term for adding water to create a less concentrated solution?
7. What is the formula for dilution problems?
8. You add 20 gallons of regular milk to 10 gallons of 15% chocolate milk. What is the new concentration for the milk?
9. What is Normality?
10. How many particles will $CuSO_4$ break into?
11. How many particles will N_2H_4 break into?
12. How many particles will $CaCl_2$ break into?
13. How many particles will $Al(NO_3)_3$ break into?
14. What is the normality of 2.0 M $CuSO_4$?
15. What is the normality of 3.0 M N_2H_4?
16. What is the normality of 2.;0 M $CaCl_2$?
17. What is the normality of 3.0 M $Al(NO_3)_3$?

Reaction Rates

1. What is the definition for 'rate'?
2. In chemistry, what do we measure for rate of reaction?
3. In chemistry, what units do we use for rate of reaction?
4. What is the rate equation for the reaction: $A + B \rightarrow C + D$?
5. What is the rate equation for the reaction: $X + Y + Z \rightarrow S + T$?
6. What is the rate equation for the reaction: $D \rightarrow C + F$?
7. Two Reactants: You double the first reactant and triple the second reactant. What is the new rate?
8. Two Reactants: You triple the first reactant and double the second reactant. What is the new rate?
9. Two Reactants: You double the first reactant and cut the second in half. What is the new rate?
10. Two Reactants: You quadruple the first reactant and cut the second in half. What is the new rate?
11. You smash ice increasing the surface area to 8 times the original. What is the new rate of melting?
12. You sift flour increasing the surface area to 25 times the original. What is the new rate of reaction?
13. What is the 10 ^oC rule?
14. What is the term for the molecules / KE curve?
15. When you heat a reaction 10 C, what is the increase in speed of the reactants?
16. When you heat a reaction 10 C, what is the increase in number of collisions of the reactants?
17. What is the new rate of reaction when the temperature changes from 20 C to 50 C?
18. What is the new rate of reaction when the temperature changes from 20C to 60 C?
19. What is the new rate of reaction when the temperature changes from 20 c to 0 C?
20. What is the term for the amount of energy required to complete a chemical reaction?
21. Why does the rate of reaction double for each 10 C increase in temperature?
22. What is a catalyst?
23. What do we call a material that speeds up a reaction but doesn't change itself?
24. What does a catalyst do to get more reactants to react?
25. What does the heat content diagram look like if: Ea = +40 and ΔH = - 30?
26. What does the heat content diagram look like if: Ea = +20 and ΔH = +10?
27. What does the heat content diagram look like if: Ea = +60 and ΔH = +50?
28. What does the heat content diagram look like if: Ea = +50 and ΔH = - 20?
29. What two things are required for an 'Activated Complex'?
30. What do we call the intermediate 'particle" in a reaction that has the Ea and the correct alignment?

AR Chemistry Review Set: ANSWERS

Molarity, Normality, Dilution, Breaking Compounds Apart.

1. What is the definition for Molarity? **M = moles solute / Liters solution**
2. What is the term for the material being dissolved into a solution? **solute**
3. What is the term for the material doing the dissolving in a solution? **solvent**
4. You have a solution that is 25% water and 75% alcohol. What material is the solute? **water**
5. You have a solution that is 25% water and 75% alcohol. What material is the solvent? **alcohol**
6. What is the term for adding water to create a less concentrated solution? **dilution**
7. What is the formula for dilution problems? **m v = m v**
8. You add 20 gallons of regular milk to 10 gallons of 15% chocolate milk. What is the new concentration for the milk? **5%**
9. What is Normality? **N = moles swimmers / Liters solution : N = (M) (# swimmers)**
10. How many particles will $CuSO_4$ break into? **2**
11. How many particles will N_2H_4 break into? **1**
12. How many particles will $CaCl_2$ break into? **3**
13. How many particles will $Al(NO_3)_3$ break into? **4**
14. What is the normality of 2.0 M $CuSO_4$? **4.0 N**
15. What is the normality of 3.0 M N_2H_4? **3.0 N**
16. What is the normality of 2.0 M $CaCl_2$? **6.0 N**
17. What is the normality of 3.0 M $Al(NO_3)_3$? **12.0 N**

Reaction Rates

1. What is the definition for 'rate'? **rate = performance / time**
2. In chemistry, what do we measure for rate of reaction? **change in concentration / time**
3. In chemistry, what units do we use for rate of reaction? **M / sec or mol / L sec**
4. What is the rate equation for the reaction: $A + B \rightarrow C + D$? **R = k [A] [B]**
5. What is the rate equation for the reaction: $X + Y + Z \rightarrow S + T$? **R = k [X] [Y] [Z]**
6. What is the rate equation for the reaction: $D \rightarrow C + F$? **R = k [D]**
7. Two Reactants: You double the first reactant and triple the second reactant. What is the new rate? **4 x faster**
8. Two Reactants: You triple the first reactant and double the second reactant. What is the new rate? **6 x faster**
9. Two Reactants: You double the first reactant and cut the second in half. What is the new rate? **same**
10. Two Reactants: You quadruple the first reactant and cut the second in half. What is the new rate? **2 x faster**
11. You smash ice increasing the surface area to 8 times the original. What is the new rate of melting? **8 x faster**
12. You sift flour increasing the surface area to 25 times the original. What is the new rate of reaction? **25 x faster**
13. What is the 10 ^oC rule? **For each 10 C change in temperature, the rate doubles**
14. What is the term for the molecules / KE curve? **Poisson Distribution**
15. When you heat a reaction 10 C, what is the increase in speed of the reactants? **1-2 % faster**
16. When you heat a reaction 10 C, what is the increase in number of collisions of the reactants? **1-2% more**
17. What is the new rate of reaction when the temperature changes from 20 C to 50 C? **8x faster**
18. What is the new rate of reaction when the temperature changes from 20C to 60 C? **16 x faster**
19. What is the new rate of reaction when the temperature changes from 20 c to 0 C? **4 x slower**
20. What is the term for the amount of energy required to complete a chemical reaction? **Activation Energy (E_a)**
21. Why does the rate of reaction double for each 10 C increase in temperature? **Twice as many molecules with E_a**
22. What is a catalyst? **A material that speeds up a reaction without being changed itself**
23. What do we call a material that speeds up a reaction but doesn't change itself? **catalyst**
24. What does a catalyst do to get more reactants to react? **Lowers the E_a**
25. What does the heat content diagram look like if: Ea = +40 and ΔH = - 30? **Hill goes up 40, Products are 30 below the start**
26. What does the heat content diagram look like if: Ea = +20 and ΔH = +10? **Hill goes up 20, Products are 10 above the start**
27. What does the heat content diagram look like if: Ea = +60 and ΔH = +50? **Hill goes up 60, Products are 50 above the start**
28. What does the heat content diagram look like if: Ea = +50 and ΔH = - 20? **Hill goes up 50, Products are 20 below the start**
29. What two things are required for an 'Activated Complex'? **1. E_a 2. Correct Alignment**
30. What do we call the intermediate 'particle" in a reaction that has the Ea and the correct alignment? **Activated Complex**