

Quarter 3 Review Worksheet-Chem

Name: _____ Period: _____

UNIT 6- KMT and Gas Laws

1. What is an elastic collision?
2. How does the kinetic energy of particles change when temperature changes?
3. Use KMT to describe how gases are compressible and expandable.
4. What are the 3 assumptions of KMT?
5. Use your knowledge of gas properties to describe what is happening in the following situations:
 - a. Your car tires appear flat in the morning after a cold night.
 - b. Your ears “pop” as you are driving up a mountain and increasing in elevation at quick rate.
6. What units do the following variables need to be in for the ideal gas law?
 - a. pressure: _____
 - b. volume: _____
 - c. “n”: _____
 - d. temperature: _____
7. If I contain 20 g of chlorine gas in a container with a volume of 40 liters and at a temperature of 300 K, what is the pressure inside the container?
8. If I have 15 moles of gas held at a pressure of 10 atm and a temperature of 500 K, what is the volume of the gas?

UNIT 7- Thermochemistry

Part 1: Enthalpy and Specific Heat

9. The symbol used to represent change in enthalpy is _____.
 10. When a chemical reaction gains heat, it is an _____ reaction, and its enthalpy value is (positive/negative) _____.
 11. When a substance goes from a solid to a liquid, it is an (endothermic/exothermic) process. The sign for ΔH is _____.
 12. $\text{H}_2\text{O}(\text{g}) \rightarrow \text{H}_2\text{O}(\text{s})$ is an (endothermic/exothermic) process. The sign for ΔH is _____.
 13. When a chemical reaction releases heat, it is an _____ reaction, and its enthalpy value is (positive/negative) _____.
 14. Describe the difference between temperature and heat.
 15. The amount of energy required to raise the temperature of 1 gram of a substance 1°C is called _____.
- Calculate the following and show your work!**
16. What is the mass of a piece of iron that absorbs 1100 J of energy when its temperature changes from 25°C to 175°C ? (specific heat of iron: $0.450 \text{ J/g } ^\circ\text{C}$)
 17. How many joules of heat are needed to raise the temperature of 15.0 g of aluminum from 20°C to 55°C , if the specific heat of aluminum is $0.90 \text{ J/g } ^\circ\text{C}$?
 18. The products in an exothermic reaction have a (greater/smaller) enthalpy than the reactants.
 19. Use the standard enthalpies of formation (your half sheet) to calculate the overall change in enthalpy for the reaction.
$$\text{CH}_4(\text{g}) + 2 \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + 2 \text{H}_2\text{O}(\text{l})$$

Part 2: Entropy

20. Define entropy.
21. What is the symbol used to represent change in entropy? _____
22. Predict the sign on the change in entropy for the following equations:
- a. $2 \text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2 \text{SO}_3(\text{g})$ _____
 - b. $\text{MgO}(\text{s}) + \text{CO}_2(\text{g}) \rightarrow \text{MgCO}_3(\text{s})$ _____
 - c. $2\text{H}_2\text{O}_2(\text{l}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{O}_2(\text{g})$ _____
 - d. $\text{H}_2\text{O}(\text{l}) \rightarrow \text{H}_2\text{O}(\text{g})$ _____

UNIT 8- Solutions

23. What factors determine whether one substance will dissolve in another (solubility)?
24. What three factors influence the rate of solvation?
25. What are the two components of a solution? Define each component.
26. As the temperature increases, what happens to the solubility of a solid? Of a gas?
27. How is a supersaturated solution created?
28. Explain the meaning of the phrase "like dissolves like"?
29. How would you prepare 100.ml of a 0.500M HNO_3 solution if you have a 12.0M stock solution of HNO_3 ?
30. What volume of a 6.0M NaCl solution can be made from 3.51g of NaCl ?
31. How many grams of solvent are necessary to dissolve 325g of lithium bromide at 50°C if the solubility of LiBr is 203g/100g water at this temperature?
32. What is the molar concentration (molarity) of a 125ml solution made by dissolving 34.2g of sucrose, $\text{C}_{12}\text{H}_{22}\text{O}_{11}$, in water?
33. 12.5 g barium chloride dissolves in 250. ml of water. Calculate the mass percent concentration.
34. Which of the following substances will affect the boiling point the most? CH_4 , NaCl , or MgCl_2 ?