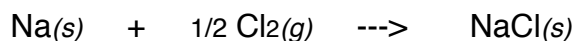


Honors Chem - 2nd semester - Review Sheet for Final

1. If 35,005 J of heat are released when silver is cooled from 45°C to 5.0°C, how much does the silver weigh? (look-up specific heat on your worksheet 7.1).
2. A piece of hot iron (350.0 °C) was dropped into 50.0 grams of 10.0°C water. The final temperature of the mixture was 65.5°C. How much does the iron weigh?
3. Using Hess's Law and the reference sheet (packet 7), calculate ΔH_f for pentane (C₅H₁₂).

4. Determine if the following reaction will occur at room temperature (298 K) by calculating ΔG :



5. How much 9.37% NaOH solution can be made using 26.1 g of NaOH?

Ans: _____

6. What is the molarity of a solution containing 5.2 grams NaC₂H₃O₂ dissolved in 710 mL of solution?

Ans: _____

7. How much KNO₃ can be dissolved in 121.0 g of water at 75.0°C? _____
(look at graph on WS 8.3)

8. How many grams of water will it take to dissolve 26.0 g KCl at 56.0°C? _____
(look at graph on WS 8.3)

9. How much water should be added to 85 mL of 4.0 M NaCl to make a 1.7 M solution?

Ans: _____

10. Convert 0.00233% into ppm.

Ans: _____

11. A mixture appears cloudy, but no particles seem to be settling. What type of mixture is it?
(solution, colloid, suspension?)

Ans: _____

12. What is the freezing point depression of water in a solution of 25.0 g of NaCl and 1205 g of water? (k_f for water is $-1.86\text{ }^\circ\text{C}/m$)

A ---> B

	initial [A] (mol/L)	initial rate (mol/L · s)
experiment 1	0.04	4×10^{-4}
experiment 2	0.08	16×10^{-4}
experiment 3	0.16	64×10^{-4}

13. What is the order of this reaction? _____

14. Write the *rate law* for this reaction: _____

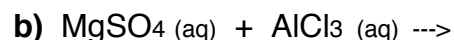
15. What is the rate law constant (k)? _____

16. What would be the rate if **[A] = 0.21 M**?

17. a) HgSO_4 _____ (insol or sol) **[use buff]**

b) $(\text{NH}_4)_2\text{CO}_3$ _____ (insol or sol)

18. Write the complete, balanced equation:



19. **1.75 g of NaOH (a strong base) is dissolved in 2.50 L of solution**

a. Write the equation for the ionization of NaOH in water:

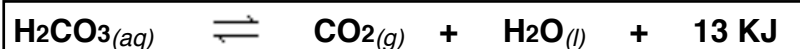
b. What is the molarity of the NaOH solution?

c. What is the $[\text{OH}^-]$ of the solution?

d. What is the pOH of the solution?

e. What is the pH of the solution?

20. How many mL of 0.152 M HNO₃ would be needed to titrate 11.21 mL of 0.254 M KOH?
21. A HCl solution has a pH = 2.55. What will be the molarity of the solution?
22. How many ml of 0.152 M H₃PO₄ would be needed to titrate 11.21 mL of 0.254 M Mg(OH)₂?
23. Write the balanced equation for the reaction in #22.
24. 15.0 g of nitrous acid (a weak acid) is dissolved into 750. mL of solution. What is the pH of this solution? (look up K_a on WS 10.9)



25. List 5 ways to increase the amount of water produced by the above reaction.
26. What is the oxidation # of **sulfur** in each of the following?
 CaS₂O₃ _____ H₂SO₃ _____ SO₃ _____ SO₄²⁻ _____
- Identify what is oxidized, what is reduced, the oxidizing agent, and the reducing agent for each:
27. HNO₃ + Cu₂O ---> Cu(NO₃)₂ + NO + H₂O
28. I₂ + HNO₃ ---> HIO₃ + NO₂
29. Consider a voltaic cell containing Ag in a solution of AgCl and Pb in a solution of PbCl₂.
- Write the half-reaction for the anode (oxidation):
 - Write the half-reaction for the cathode (reduction):
 - Use the shorthand method to represent this cell:
 - Calculate the cell potential:

30. Write the reaction for the halogenation of 2,3-butandiol with fluorine gas.

- Include all products.
- Determine the % formation of each isomer.
- Name each isomer.

31. Draw 3,4-dibromotoluene:

32. Draw the **line structure** for 2,4-dimethyl-3-nitro-1,3-pentadiene

33. Name this: $\text{CH}_2\text{ICH}(\text{CH}_3)(\text{CH}_2)_2\text{CH}=\text{CHCH}_2(\text{NO}_2)$

34. Draw all 3 isomers for $\text{C}_3\text{H}_8\text{O}$:

35. Using the solubility data from packet 10's reference sheet, calculate the K_{sp} of potassium chlorate at 0.0°C .