

CH30S

Solutions Unit Review

1. What are the properties of a true solution?
2. Define the terms solute and solvent. How would you recognize them in a liquid/liquid solution?
3. There are 9 different types of solutions (see your notes). List 6, and give an example of each.
 - a.
 - b.
 - c.
 - d.
 - e.
 - f.
4. State the difference between homogeneous and heterogeneous solutions.
5. Explain the difference between saturated, unsaturated and supersaturated solutions. State any conditions (temp/press./etc) that are necessary.
6. Describe how you would prepare a supersaturated solution.

7. List three ways to make a substance dissolve more quickly. Will these methods work all the time? Why/Why not?

8. Explain how pressure affects the solubility of a gas. Give an example.

9. Explain, at the molecular level, the difference between dissolving sugar (covalent compound) and salt (ionic compound) in water.

10. Calculate the concentration of a solution in which 0.125mol of NaOH solute has been dissolved in 200mL of solution. **(0.625mol/L)**

11. Calculate the concentration of a solution if 40.0g of K_2SO_4 is dissolved in 150mL of solution. **(1.53mol/L)**

12. What mass of $MgCO_3$ would be required to make 75.0mL of a 0.450mol/L solution? **(2.87g)**

13. What volume of solution would be required to dissolve 15.0g of aluminum oxide to make a 0.125mol/L solution? **(1.18L)**

14. If 50.0mL of a 0.750mol/L solution of HCl is added to 75.0mL of a 0.550mol/L solution of HCl determine the final concentration. **(0.63mol/L)**
15. What volume of water must be added to 125mL of 1.25mol/L solution of MgSO_4 to make a 0.475mol/L solution? **(204mL)**
16. Concentrated sulphuric acid is bought as a stock solution with a concentration of 18mol/L. If you need 250mL of 0.750mol/L solution, how much stock sulphuric acid solution would you need? **(10mL)**
17. Describe how you would use a 200mL volumetric flask to make 200mL of 0.250mol/L solution of calcium hydrogen carbonate. Show any calculations necessary. **(8.11g)**
18. If 40.5g of sodium chromate is mixed with an excess of aluminum nitrate, calculate the mass of aluminum chromate precipitate that would be produced. **(32.16g)**

19. What is meant by the term “like dissolves like”?
20. Write the balanced equations (including states) showing the dissolving of the following solids in water:
- $C_6H_{12}O_6$
 - KCl
 - $MgCl_2$

Use your solubility curve to answer the following questions:

21. Which solid is most soluble at 40°C?
22. Which solid is affected most by a change in temperature?
23. What is the solubility of KNO_3 in g/25mL at 30°C?
24. At what temperature is the solubility of KNO_3 and KCl the same?
25. At what temperature does the solubility of KNO_3 begin to exceed the solubility of NaCl?
26. If a solution contains 60g KNO_3 at 50°C, describe (quantitatively) what can be done to saturate the solution.
27. How much solid would precipitate out of the solution if the temperature of a saturated KCl solution was dropped from 100°C to 0°C?
28. How many grams of $KClO_3$ will dissolve in 150g of water at 30°C?
29. If 200g of KNO_3 are added to 100g of water at 40°C, how much will not dissolve?
30. Which compound(s) on the graph do you think are gases? Why?

Solubility Curve

