Key

SOLUTIONS REVIEW

#1-8 Fill in the blanks with the vocabulary word to answer each question below:

Pairs of liquids that will not mix (example oil and water) are called _____(1)_____ liquids. immiscible

A solution with a concentration higher than the solubility is _____(2)_____. supersaturated

Pressure has an appreciable effect on the solubility of ____(3)_____ in liquids. gases

Pure gold is 24 carat. 14-carat gold contains 14 parts gold and 10 parts other metals. 14-carat gold is thus a solid solution called a(n) ____(4)_____. alloy

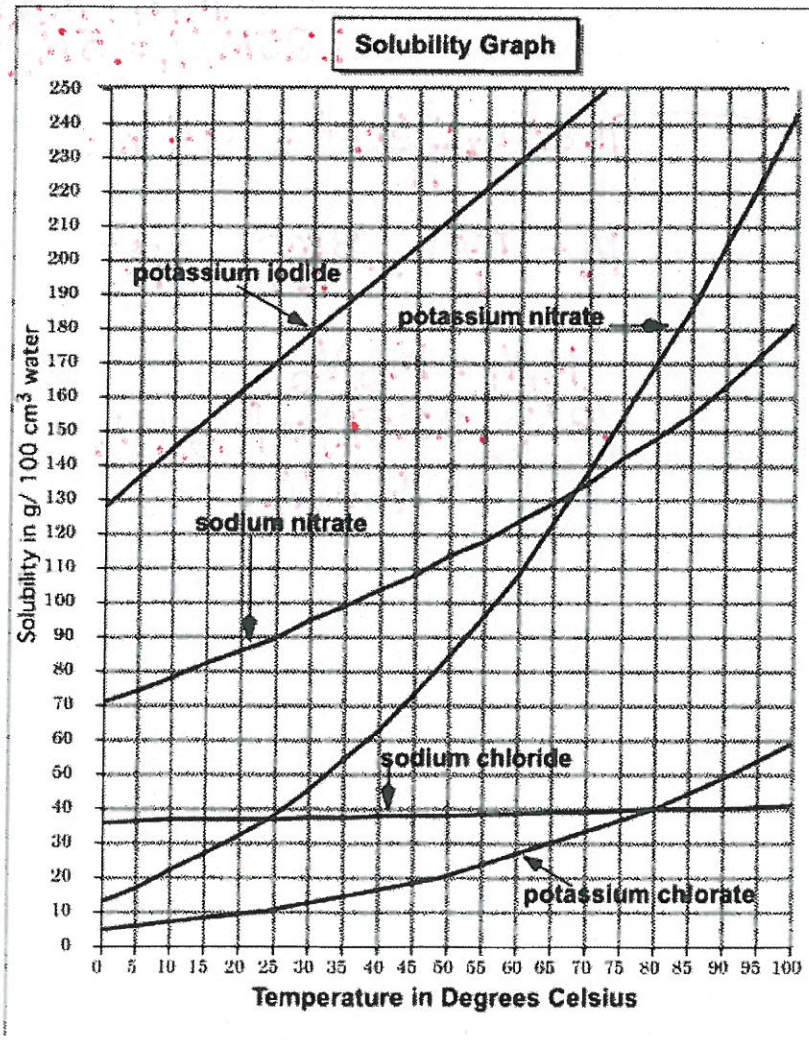
A substance that dissolves other materials is a _____(5)_____. The substance being dissolved is a _____(6)_____. solvent solute

The three word phrase _____(7)_____ is a useful way to remember that polar substances can dissolve other polar substances and nonpolar substances can dissolve other nonpolar substances. like dissolves like

The process of dissolving is called _____(8)_____ and involves two steps: 1.) solute particles are surrounded by solvent particles and 2.) solute particles are pulled into solution. dissociation/solvation

#9-11 List three of the four ways to increase the rate at which a solid will dissolve in a liquid: ↑ temp ↓ particle size mix choose "like" solute/solvent

#12-20: Use the solubility curve below to help you answer the questions.



12. Which substance is most soluble at 60°C? potassium iodide

13. Which two substances have the same solubility at 80°C? sodium chloride and potassium chlorate

14. Which substance's solubility changes the most from 0°C to 100°C? potassium nitrate

15. If 50mL of water that is saturated with potassium chlorate at 50° is slowly evaporated to dryness, how many grams of the dry salt would be recovered? 10g

16. What is the solubility of potassium nitrate at 90°C? ~205g

17. At what temperature does potassium iodide have a solubility of 150g/100cm³ water? ~17°C

18. You have a solution of sodium nitrate containing 140g at 65°C. Is the solution saturated, unsaturated, or supersaturated? supersaturated

19. You have a solution of potassium chlorte containing 4g at 65°C. How many additional grams of solute must be added to it to make the solution saturated? ~26g

20. A solution of potassium iodide at 70°C contains 200g of dissolved substance in 100 cm³ of water. The solution is allowed to cool. At what new temperature would crystals begin to start forming? ~42°C

21. What is the percent by mass concentration of sodium bromide in a solution which contains 50.0g of sodium bromide in 200.0g of water?

a. 40% **b. 20%** c. 25% d. 33%

$\frac{50g}{250g} = .2 \times 100 = 20\%$

22. A solution is prepared by dissolving 23.7g of $CaCl_2$ in 375g of water. What is the molality of the solution?

a. 0.214 **b. 0.569** c. 5.7 d. 1.76

$23.7g\ CaCl_2 \times \frac{1mol\ CaCl_2}{110.98g} = .214mol$

$m = \frac{mol}{kg} = \frac{.214mol}{.375kg} = .57m$

23. What is the molarity of a solution that contains 125gNaCL in 4L solution?

a. 0.535M b. 2.14M c.8.56M d. 31.3M

$125g\ NaCl \times \frac{1mol\ NaCl}{58.44g} = 2.14mol$

$M = \frac{mol}{L} = \frac{2.14mol}{4L} = .5$

24. What is the molality of a solution that contains 31gHCl in 5000g water?

a. 0.062m b. 0.425m **c. 0.170m** d. 15.5m

$31g\ HCl \times \frac{1mol\ HCl}{36.46g} = .85mol$

$m = \frac{mol}{kg} = \frac{.85mol}{5kg} = .17m$

25. A solution is made with 0.035L of rubbing alcohol and enough water to make 50.0mL of total solution. What is the percent by volume concentration of the solution?

a. 0.07% **b. 70%** c. 1.4% d. 7%

$\frac{35mL}{50mL} \times 100 = 70\%$

26. The molarity of a solution that contains 14gKOH per 150mL is

a. 93M **b. 1.7M** c. 0.093M d.11M

$14g\ KOH \times \frac{1mol\ KOH}{56.11g} = .25mol$

$M = \frac{mol}{L} = \frac{.25mol}{.150L} = 1.66M$

27. What volume of 1.25M HCl would be required to prepare 180mL of 0.5M HCl solution?

a. 450mL **b. 72mL** c. 0.014mL d. 2.2×10^{-3}mL

$M_1V_1 = M_2V_2$

$(1.25M)V_1 = (.5M)(180mL)$

28. How many moles of solute are present in 1.25L of a 0.75M $NaNO_3$ solution?

a.1.7mol b. 0.60mol c. 0.75mol **d. 0.94mol**

$1.25L \times \frac{.75mol}{1L} = .94\ mol$

29. What is the molarity of a solution that contains 8 moles of solute in 2L of solution?

a. 4M b. 8M c. 6M d. 0.25M

$M = \frac{mol}{L} = \frac{8mol}{2L} = 4M$

30. To 225mL of a 0.8M solution of KI, a student adds enough water to make 1L of a more dilute KI solution. What is the molarity of the new solution?

a. 180M **b. 0.18M** c. 1.37M d. 10M

$M_1V_1 = M_2V_2$

$(8M)(.225L) = M_2(1L)$

$.18 = M_2$