

PERIOD _____

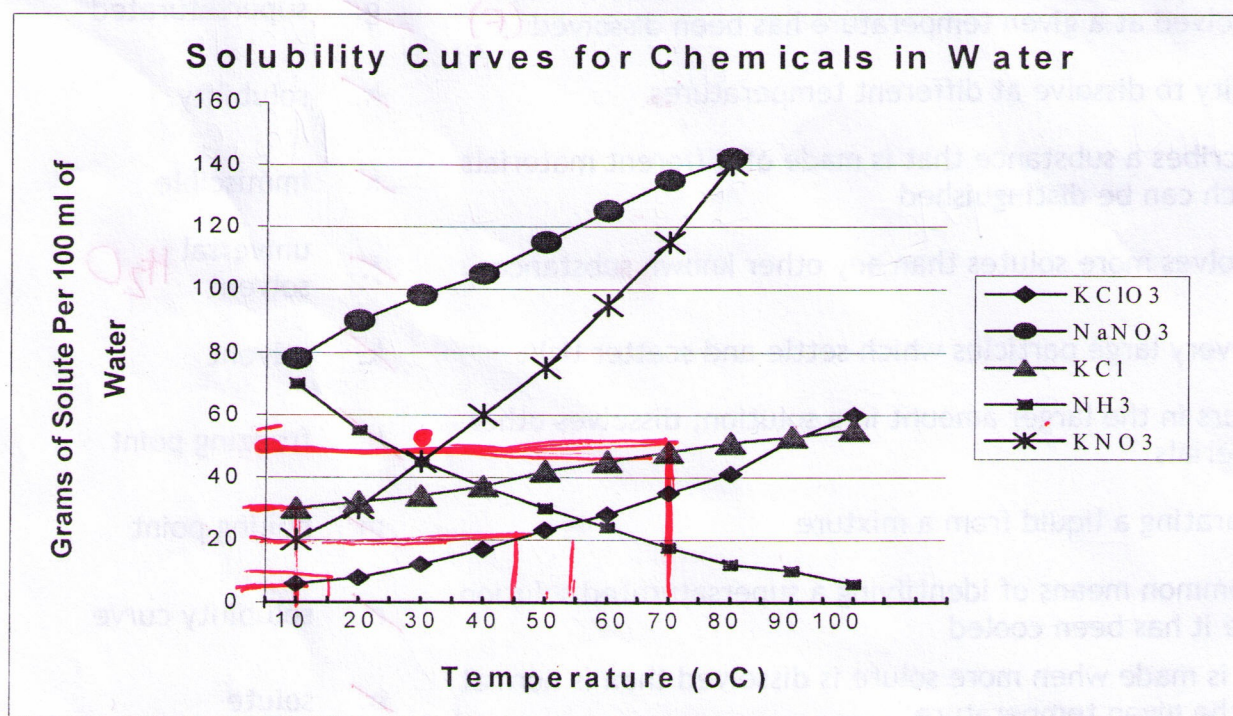
NAME _____

KEY

Solution Unit Review

- | | | | | |
|----|----|---|---------------|---|
| M | 1 | when a solute is added, this is raised | a. | mixture |
| N | 2 | a graph which shows the comparison of solute solubility over a range of temperatures | b. | suspension |
| P | 3 | homogeneous material that cannot be separated with a filter and is transparent if it is a liquid | c. | transparent |
| I | 4 | When two liquids will not mix or blend | | d. colloid |
| O | 5 | material that is dissolved to make a solution; occurs in the smaller amount within the solution | e. | unsaturated |
| C | 6 | see through or does not scatter light | f. | saturated |
| E | 7 | type of solution made when all the solute that can be dissolved at a given temperature has been dissolved (F) | g. | supersaturated |
| H | 8 | ability to dissolve at different temperatures | h. | solubility |
| T | 9 | describes a substance that is made of different materials which can be distinguished | i. | immiscible |
| J | 10 | dissolves more solutes than any other known substance | j. | universal solvent H₂O |
| B | 11 | has very large particles which settle and scatter light | k. | solvent |
| K | 12 | occurs in the larger amount in a solution; dissolves other materials | l. | freezing point |
| R | 13 | separating a liquid from a mixture | m. | boiling point |
| Q | 14 | A common means of identifying a supersaturated solution, once it has been cooled | n. | solubility curve |
| G | 15 | this is made when more solute is dissolved than is normal for the given temperature | o. | solute |
| D | 16 | this material cannot be separated with a filter but scatters light with its medium particles | p. | solution • |
| S | 17 | this term means that a substance is the same throughout | q. | solidification |
| F | 18 | what is made when no more solute can be dissolved at a given temperature | r. | evaporation |
| L. | 19 | when a solute is added, this is lowered | s. | homogeneous |
| A | 20 | made with a combination of 2 or more materials that can be separated with various physical processes | t. | heterogeneous |

- Name 2 things which are homogeneous. Koolaid, air, saltwater, sugar H_2O
- Name 2 things which are heterogeneous. sand & H_2O , trail mix
granite
- Name 3 factors that change the speed that sugar dissolves. Adding heat, Agitation (stir or shake)
particle size
- A chocolate ice cream shake is not a solution. List the 5 properties of solutions to tell why not.
 - Homogeneous
 - In same phase
 -
 -
 -
- If 18-karat gold is made of 75% gold and 25% copper, the solute is the Copper the solvent is the Gold.



Use this graph to answer questions 6 through 12 below

- To make an **unsaturated** solution of KClO₃ at 45 °C, you could add less than 20g grams KClO₃.
- To make an **saturated** solution of KClO₃ at 15 °C, you could add 10g grams KClO₃.
- To make a **supersaturated** solution of KClO₃ at 10 °C, you could add more than 5g grams KClO₃.
- Which substance is most soluble at 20 °C? NaNO₃ at 70 °C? NaNO₃ at 100 °C?
KClO₃ (no data on NaNO₃ after 80°C)

10. At approximately what temperature will 30 g of KCl dissolve in the water? 10° 50 g?
70°

11. What is the MAXIMUM amount of KCl that will dissolve in the water at 70 degrees? 50g

12. At 55 °C, 30 g of KClO_3 is added to the water. The KClO_3 will Supersaturated.
a. all dissolve b. dissolve a little c. not dissolve at all
(dissolve most)

Know the following formulas by heart:

Molarity (M) = $\frac{\text{moles of solute}}{\text{Liters of solution}}$

$M_1V_1 = M_2V_2$ Dilution Equation

- To convert from moles to grams, multiply by the molar mass
- To convert from grams to moles, divide by the molar mass
- To convert from mL to L, divide by 1000
- To convert from g to kg, divide by 1000

Using the above equation for molarity, solve the following:

.3M 1. 0.50 mol of MgCl_2 in 1.5 L of solution

$$M = \frac{.50 \text{ mol}}{1.5 \text{ L}}$$

1.3M 2. 1.0 mol of KCl in 750 mL of solution

$$M = \frac{1.0 \text{ mol}}{.750 \text{ L}}$$

_____ 3. 5.95 grams of NaCl in 2.00 L of solution

$$\rightarrow \frac{5.95 \text{ g NaCl}}{58.5 \text{ g}} \quad \frac{1 \text{ mol}}{58.5 \text{ g}}$$

$$M = \frac{\quad}{2 \text{ L}}$$

_____ 4. 400.0 grams of CuSO_4 in 4.00 L of solution

$$\frac{400 \text{ g CuSO}_4}{\quad \text{g}} \quad \frac{1 \text{ mol}}{\quad \text{g}}$$

$$M = \frac{\quad}{4 \text{ L}}$$

Using the Dilution equation $M_1V_1 = M_2V_2$, complete the following table

Problem Code	Stock Solution		Volume of water added	Dilute Solution	
	Concentration M_1	Volume V_1		Concentration M_2	Volume V_2
A	3.00 M HCl	16.6 ml	483.4 ml	0.100 M HCl	500.0 mL
B	0.450 M NaCl	50.0 mL	250.0 mL	.075 M	300 ml
C	6.00 M HNO ₃	120.0 mL	600 ml	1.00 M HNO ₃	720 ml
D	3.3 M	300.0 mL .3L	1.7 L	0.500 M NaCl	2.00 L
E	1.00 M KI	27.8 ml	6.00 mL	.82 M	33.8 mL
F	18 M H ₂ SO ₄	2.00 mL	178 ml	0.200 M H ₂ SO ₄	180 ml
G	.3125 M	.8 mL	1700.0 mL 1.7 L	0.100 M HCl	2.50 L
H	3.2 M	50.0 mL	750.0 mL	0.200 M NaCl	800 ml
I	9.00 M HNO ₃	200.0 mL .2L	5.05 L	.34 M	5.25 L

$$3x = .1(500)$$

$$3x = 50$$

$$x = \frac{50}{3}$$

$$x = 16.6$$

1. Fifty (50.0) milliliters of 2.00 M ammonium acetate are placed in a beaker and 200.0 mL of distilled water are added. What is the concentration of the more dilute solution?

$$M_1V_1 = M_2V_2$$

$$2(50) = x(250)$$

$$100 = 250x$$

$$x = \frac{100}{250}$$

$$x = .4M$$

2. Eleanor must prepare 300.0 mL of a 0.750 M NaBr solution using a 2.0 M NaBr stock solution. How many milliliters of a stock solution should she use?

$$M_1V_1 = M_2V_2$$

$$2x = .750(300)$$

$$2x = 225$$

$$x = 112.5$$

Use your solubility chart to identify whether or not the following compounds are (S) soluble or (I) insoluble in water.

S	lithium carbonate
S	NaCl
S	Mg(NO ₃) ₂
S	potassium iodide
I	Al(OH) ₃
I	Ca ₃ (PO ₄) ₂