SOLUBILITY CURVE WORKSHEET

Use your solubility curve graph provided to answer the following questions.

1. What are the customary units of solubility on solubility curves? _____

2. Define solubility. _____

3. According to the graph, the solubility of any substance changes as _____ changes.

4. List the substances whose solubility decreases as temperature increases. _____
_____

5. Which substance is least affected by temperature changes? _____

6. How many grams of ammonium chloride (NH_4Cl) at 50°C? _____

7. _____ and _____ have the same solubility at approximately 78oC.

8. Which compound is least soluble in water at 10°C? _____

9. How many grams of KNO_3 can be dissolved at 50^oC? _____

10. Are the following solutions unsaturated, saturated, or supersaturated?

    a. 45g of $NaNO_3$ in 100 g of water at 30°C._____

    b. 60g of $KClO_3$ in 100 g of water at 60°C._____

11. How many grams of sodium chloride, NaCl are required to saturate 100 grams of water at 100° C? _____

12. How many grams of $NaNO_3$ are required to saturate 100 grams of water at 90°C?____

13. How many grams of KI will saturate water at 20°C?_____

14. At what temperature would 25g of potassium chlorate ($KClO_3$) dissolve? _____

15. At what temperature would 55g of NH_4Cl dissolve? _____

16. 89 g $NaNO_3$ is prepared at 30°C.

    a) Will all of the salt dissolve? _____

    b) What mass of $NaNO_3$ will dissolve at this temperature? _____

17. If 25 grams of NH_4Cl is dissolved at 50°C, how many additional grams NH_4Cl would be needed to make the solution saturated at 80°C? _____

18. At 50°C, how many grams of KNO_3 will dissolve? _____

19. At 70°C, how many grams of cerium (III) sulfate ($Ce_2(SO_4)_3$) dissolve? _____

20. Determine if each of the following is unsaturated, saturated, or supersaturated.

a. 55g of NH_3 at 20^oC._____

b. 10g of $Ce_2(SO_4)_3$ at 10^oC._____

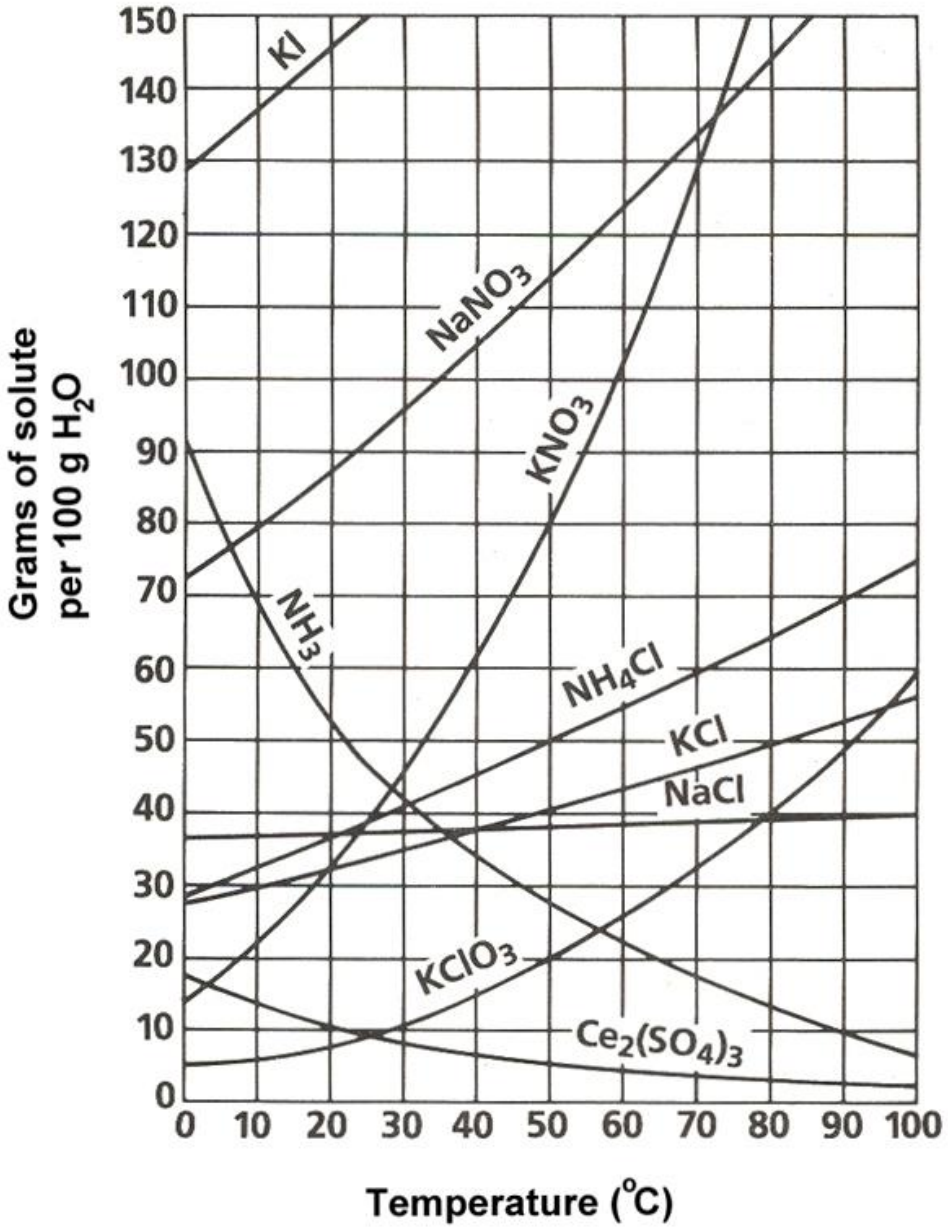
c. 125g of KNO_3 at 60^oC. _____

d. 65g of NH_4Cl at 80^oC. _____

f. 80g of $NaNO_3$ at 10^oC. ._____

g. 145g of $NaNO_3$ at 80^oC. ._____

h. 35g of NaCl at 100^oC. ._____


Grams of solute per 100 g H_2O
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90 100
Temperature (°C)
KI
$NaNO_3$
KNO_3
NH_3
NH_4Cl
KCl
NaCl
$KClO_3$
$Ce_2(SO_4)_3$

SOLUBILITY CURVE WORKSHEET KEY

Use your solubility curve graphs provided to answer the following questions.

1. What are the customary units of solubility on solubility curves? Degress Celsius and grams of solute/100g of water

2. Define solubility. A measure of how much solute can dissolve in a given amount of solvent.

3. According to the graph, the solubility of any substance changes as temperature changes.

4. List the substances whose solubility decreases as temperature increases. NH_3 and $Ce2(SO4)_2$

5. Which substance is least affected by temperature changes? NaCl,

6. How many grams of ammonium chloride (NH_4Cl) at 50°C? 50g

7. NaCl and $KClO_3$ have the same solubility at approximately 78°C.

8. Which compound is least soluble in water at 10°C? $KClO_3$

9. How many grams of KNO_3 can be dissolved at 50°C? 80g

10. Are the following solutions unsaturated, saturated, or supersaturated?

    a. 45g of $NaNO_3$ in 100 g of water at 30°C. saturated

    b. 60g of $KClO_3$ in 100 g of water at 90°C. supersaturated

11. How many grams of sodium chloride, NaCl are required to saturate 100 grams of water at 100° C? 40g

12. How many grams of $NaNO_3$ are required to saturate 100 grams of water at 75°C? 140g

13. How many grams of KI will saturate water at 20°C? 33g

14. At what temperature would 25g of potassium chlorate ($KClO_3$) dissolve? 60°C

15. At what temperature would 60g of NH_4Cl dissolve? 70°C

16. 89 g $NaNO_3$ is prepared at 30°C.

    a) Will all of the salt dissolve? No

    b) What mass of $NaNO_3$ will dissolve at this temperature? 95g

17. If 50 grams of NH_4Cl is dissolved at 50°C, how many additional grams NH_4Cl would be needed to make the solution saturated at 80°C? 15g

18. At 50°C, how many grams of KNO_3 will dissolve? 80g

19. At 70°C, how many grams of cerium (III) sulfate ($Ce_2(SO_4)_3$) dissolve? 5g

20. Determine if each of the following is unsaturated, saturated, or supersaturated.

a. 55g of NH_3 at 20°C supersaturated
b. 10g of $Ce_2(SO_4)_3$ at 10°C unsaturated
c. 110g of KNO_3 at 60°C. supersaturated
d. 65g of NH_4Cl at 80°C. saturated
e. 12g of NH_3 at 90°C. supersaturated
f. 78g of $NaNO_3$ at 10°C. saturated
g. 145g of $NaNO_3$ at 80°C. saturated
h. 35g of NaCl at 100°C. unsaturated