

Solubility Practice Packet

Name: _____

Date: _____ Pd: _____

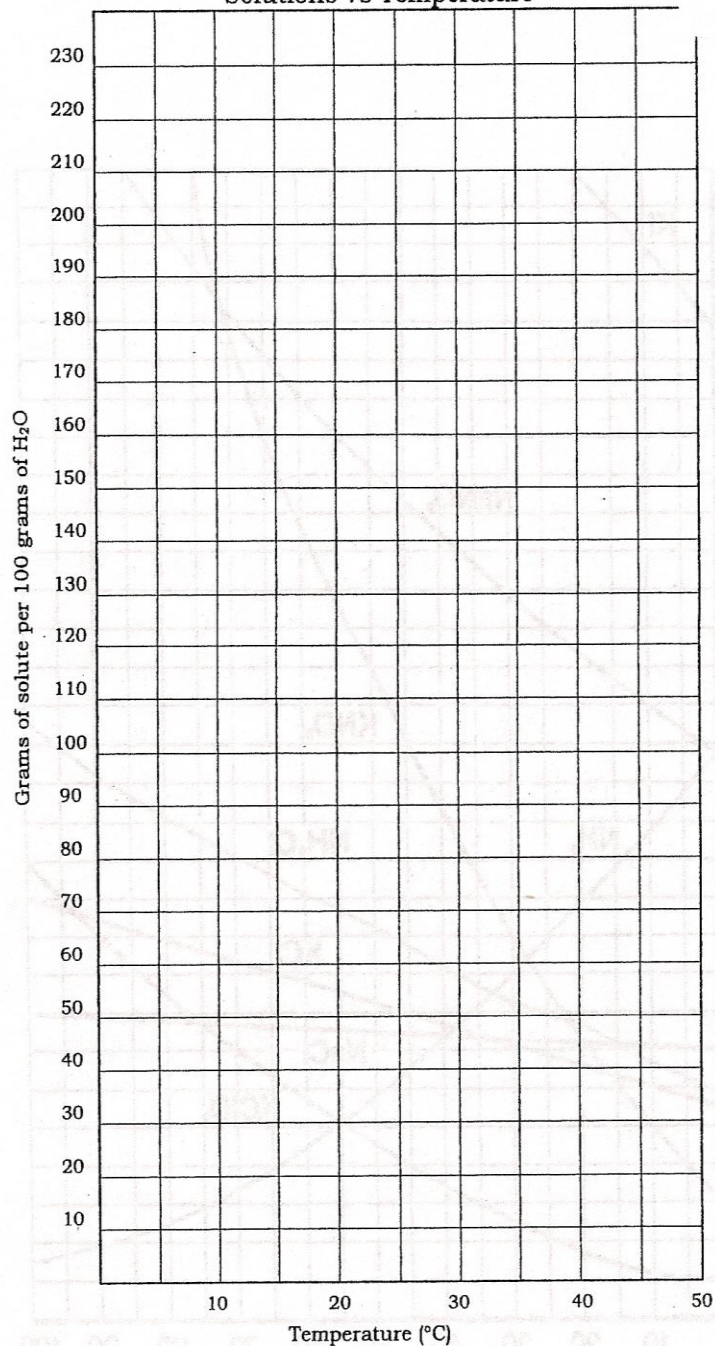
Solutions & Temperature

Some solutes dissolve better when the solution is heated. Other solutes dissolve better when the solution is cooled. The following exercise illustrates the importance of temperature in dissolving substances in a solution.

Listed below are the approximate amounts of two different solutes that will dissolve in 100 grams of water at several different temperatures. To more easily compare how temperature affects the solubility of these two solutes, prepare a graph of this data. The horizontal, or X, axis of your graph should be temperature. The vertical, or Y, axis should be grams of solute dissolved per 100 grams of water. Put both solutions on the same graph but use a different color for each substance. Be sure to make the intervals between values a size that fills most of the graph paper. Add a best fit curve to your dots when done.

Sucrose ($C_{12}H_{22}O_{11}$) (grams dissolved per 100g water)	Temperature (degrees Celsius)	Cerium Sulfate ($Ce_2(SO_4)_3$) (grams dissolved per 100g water)
180	0	21
185	5	18
190	10	16
197	15	14
204	20	12
209	25	10
220	30	9
230	35	8
239	40	7

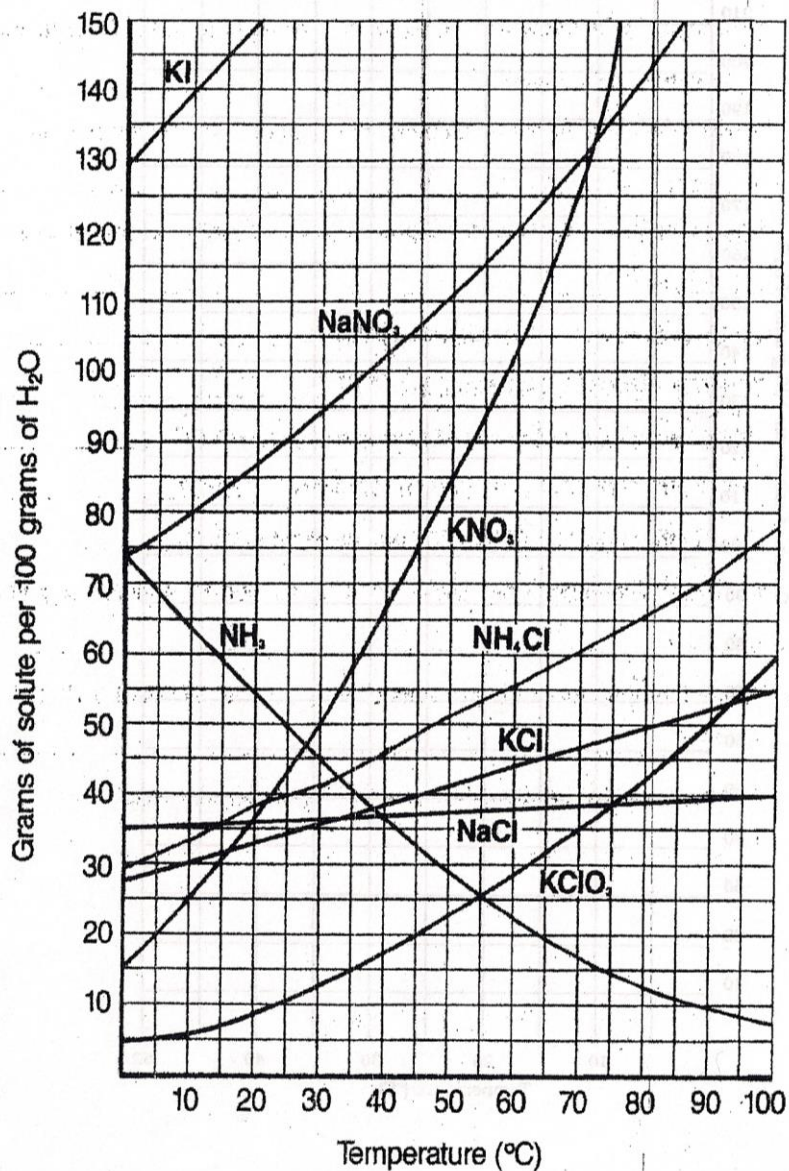
Solutions vs Temperature



After preparing your graph, use the solubility lines to answer the following questions.

- At 33°C, which solution would be most concentrated? (which one has the most solute dissolved) _____
Which substance is most soluble at this temperature? _____
- Not all solutes dissolve when they are warmed. In addition to cerium sulfate, find two other examples from your notes and worksheets. _____, _____
- If you wanted more sucrose to dissolve in water, such as sugar dissolving in tea, would you heat the solution or cool it? _____
If you wanted more cerium sulfate to dissolve in water, would you heat the solution or cool it? _____
- Between 5°C and 10°C, which solute shows the greatest change in the amount that can be dissolved in 100g of H₂O? _____

Solubility Curves II



Using the graph on the left, answer the following questions.

1. What is the solubility of potassium nitrate in 100 grams of water at 60°C?
2. What is the solubility of sodium chloride in 100 grams of water at 90°C?
3. What is the minimum temperature needed to dissolve 35 grams of potassium chloride in 100 grams of water?
4. At what temperature do potassium nitrate and sodium chloride have the same solubility?
5. If 20 grams of potassium chlorate are mixed with 100 grams of water at 40°C, how much will not dissolve?
6. If 50 grams of sodium chloride are mixed with 100 grams of water at 90°C, how much will not dissolve?
7. If 120 grams of potassium iodide are added to 100 grams of water at 15°C, how much more must be added to saturate the solution?
8. 100 grams of water are saturated with sodium nitrate at 30°C. If this solution is heated to 60°C, how much more can be dissolved?
9. 100 grams of water at 70°C are saturated with potassium chlorate. If this solution is cooled to 25°C, how much of the solid will precipitate (change, from the dissolved state to the solid state)?
10. How much potassium nitrate will dissolve in 50 grams of water at 50°C?