Name: _____ *Date:* _____

Solubility

Homework Unit 10 - Topic 2

Using Table F, tell whether the following are soluble (S) or insoluble (I):

1. $Pb(NO_3)_2$ _____
2. $(NH_4)_2(CO_3)$ _____
3. $Na_2(SO_4)$ _____
4. $Li(ClO_4)$ _____
5. $Ag_2(SO_4)$ _____

6. _____How many grams of KNO_3 can be dissolved in **100** grams of water at 50˚C?
7. _____How many grams of KNO_3 can be dissolved in **200** grams of water at 60˚C?
8. _____How many grams of KNO_3 can be dissolved in **50** grams of water at 70˚C?
9. _____Which material shown in Table G is the most soluble at 20˚C?
10. _____Which is **more** soluble at 10˚C? KNO_3 or NH_4Cl?
11. _____Which is **more** soluble at 60˚C? KNO_3 or NH_4Cl?
12. A solution containing 90 grams of $NaNO_3$ at 40˚C is (saturated, unsaturated, supersaturated)?
13. _____How much solute must be added to a solution of 60 grams of NH_4Cl at 80˚C to make it saturated?
14. _____When a saturated solution of NH_4Cl at 80˚C is cooled to 60˚C, how much solute (NH_4Cl) precipitates?
15. 90 grams of KNO_3 is added to 100 grams of water and the mixture is kept at 40˚C.
    a) _____How much KNO_3 does not dissolve?
    b) _____To what temperature must the solution be raised to dissolve all of the KNO_3?

Name: _____ *Date:* _____

A factory releases clean, warm water into a stream. The stream becomes severely polluted as a result. How does this happen? Fish living in the water depend on dissolved oxygen in order to breathe. Like other gases, oxygen molecules tend to spread out. In order to dissolve them, it is necessary to confine them. Heat speeds the molecules up and makes them spread out more - exactly the opposite of what is needed to dissolve them. As a result, heat drives the oxygen out of the water, causing the fish to die. The dead fish begin to decay. Growing decay bacteria deplete the water of oxygen even further. In this way, clean warm water can pollute a stream. ***The process of dissolving gases is opposite to the process of dissolving solids because of the differences between gases and solids.***

1. A warm can of soda is dropped an bounces down a flight of stairs. When it is opened, carbon dioxide gas coming out of solution causes it to spray all over. Explain the affect of each of the following:
   a) The fact the soda was warm.
   _____
   _____
   b) The fact the can was opened.
   _____
   _____
2. When a gas dissolves, the particles need to be confined. What do the particles of a solid need to do in order to dissolve?
   _____
3. Sugar is added to a hot cup of coffee and stirred. The sugar dissolves. Explain the affect of each of the following:
   a) The fact the coffee was hot.
   _____
   _____
   b) The fact the coffee was stirred.
   _____
   _____