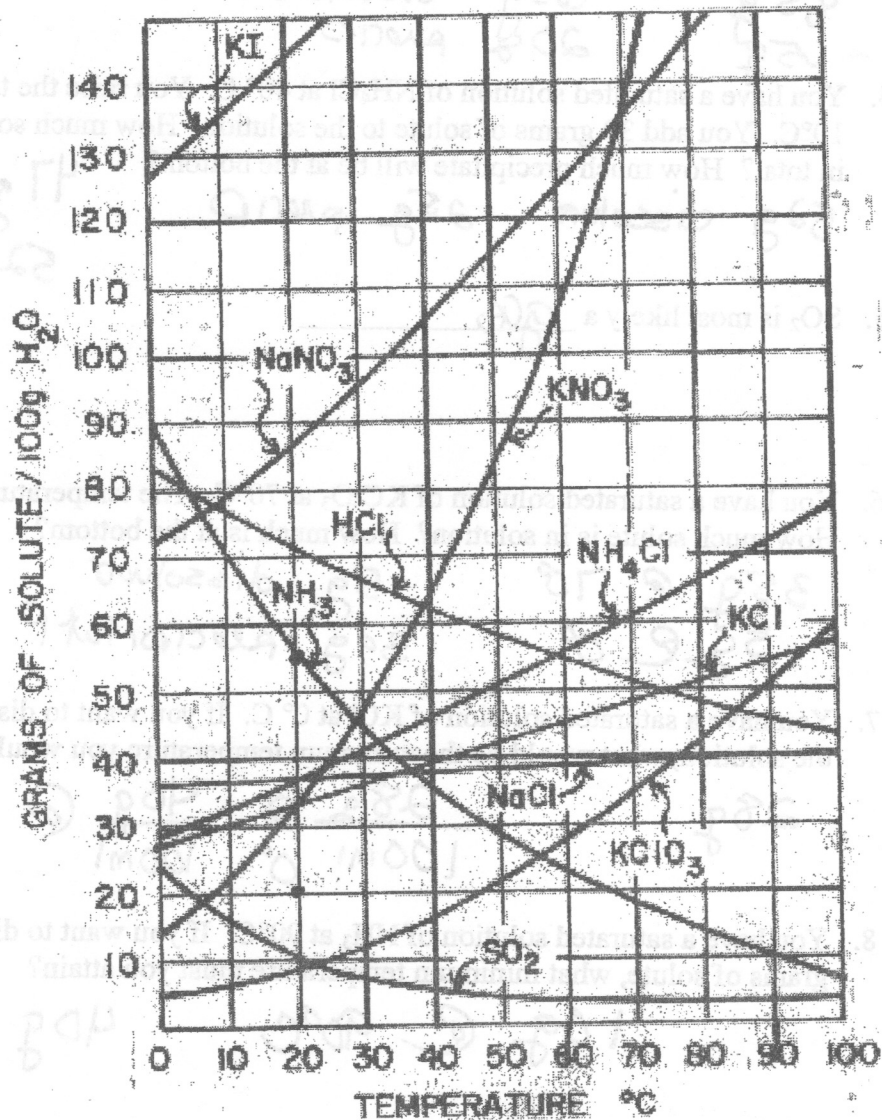


Medium level Solubility Problems

SOLUBILITY CURVES



1. You have a saturated solution of KCl at 0° C. How much would you have to raise the temperature to add a minimum of 10grams of solute?

$$28\text{g} + 10\text{g} \rightarrow 38\text{g} \quad \text{To raised to } 37^\circ\text{-}38^\circ$$

2. How many more grams of NH₃ does it take to saturate a solution if you already have 20 grams at 20° C?

$$\begin{array}{r} 56\text{g} \\ - 20\text{g} \\ \hline \uparrow 36\text{g} \text{ at } 2^\circ\text{C} \end{array}$$

3. You have a saturated solution of KNO_3 at 50°C . The temperature drops to 10°C . How much solute remains in solution, and how much precipitate forms?

$$\begin{array}{r} 85\text{g} \\ - 65\text{g} \\ \hline 20\text{g} \end{array}$$

65g dissolved
20g precipitate

4. You have a saturated solution of NH_4Cl at 40°C . You raise the temperature 10°C . You add 30 grams of solute to the solution. How much solute is dissolved in total? How much precipitate will be at the bottom?

$$52\text{g dissolved} \quad 25\text{g precipitate}$$

$$\begin{array}{r} 47\text{g at } 40^\circ \\ 52\text{g} \\ \hline 99\text{g} \\ - 74\text{g} \\ \hline 25 \end{array}$$

5. SO_2 is most likely a gas

6. You have a saturated solution of KClO_3 at 70°C . The temperature drops to 0°C . How much solute is in solution? How much is at the bottom?

$$\begin{array}{r} 35\text{g @ } 70^\circ \\ 5\text{g @ } 0^\circ \end{array}$$

5g dissolved
30g precipitate

7. You have a saturated solution of KCl at 0°C . If you want to dissolve 40 grams in the solution, what would be the minimum temperature you would need to reach?

$$\begin{array}{r} 28\text{g} \\ \hline 100\text{ml } 0^\circ \end{array} \quad \begin{array}{r} 40\text{g} \\ \hline 100\text{ml} \end{array} \quad \text{at } 40^\circ\text{C}$$

8. You have a saturated solution of NH_3 at 90°C . If you want to dissolve 30 more grams of solute, what minimum temperature must you attain?

$$10\text{g @ } 90^\circ\text{C} \quad 40\text{g @ } 35^\circ\text{C}$$

9. You have a solution that contains 10 grams of NaCl at 10°C . You add 60 grams to the solution. In total how much will be sitting on the bottom?

$$\begin{array}{r} 20\text{g @ } 10^\circ \\ - 38\text{g} \\ \hline \end{array}$$

$$\begin{array}{r} 38\text{g dissolved} \\ 32\text{g at bottom} \end{array}$$

10. You have 40 grams of KNO_3 in 100 mL of water at 50°C . You add 100 grams to the solution. How much of the added solute will dissolve? How much of the added solute will be visible on the bottom?

$$\begin{array}{r} 40\text{g} \rightarrow 45\text{g} \\ \downarrow \\ 55\text{g at bottom} \end{array}$$

140g

$$\begin{array}{r} 85\text{g dissolves at } 50^\circ \\ \rightarrow 45\text{g} \end{array}$$