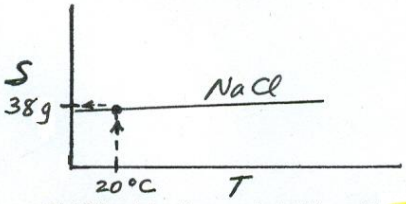
SOLUBILITY CURVES

Use Table G: Solubility Curves

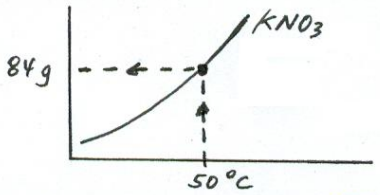
FINDING GRAMS

1) What is the maximum amount of NaCl that can be dissolved in 100 grams of H_2O at 20°C ?



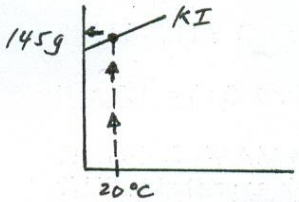
$S_{NaCl\ @\ 20°C} \approx \frac{38g}{100g\ H_2O}$ } Saturated soln

2) What is the solubility of KNO_3 at 50°C?



$S_{KNO_3\ @\ 50°C} \approx \frac{84g}{100g\ H_2O}$ " "

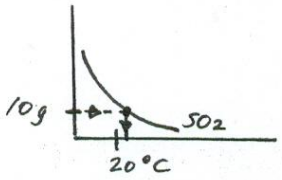
3) How many grams of KI does it take to saturate 100 grams of H_2O at 20°C ?



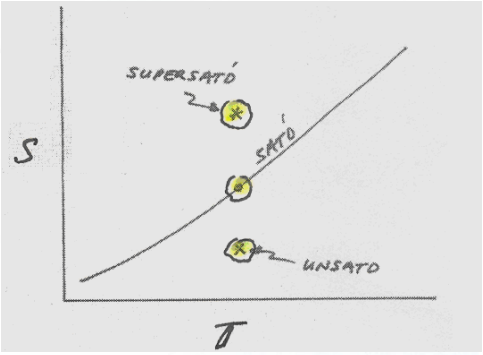
$S_{KI\ @\ 20°C} \approx \frac{145g}{100g\ H_2O}$

FINDING TEMPERATURE

4) At what temperature will 10 grams of SO_2 saturate 100 grams of H_2O ?

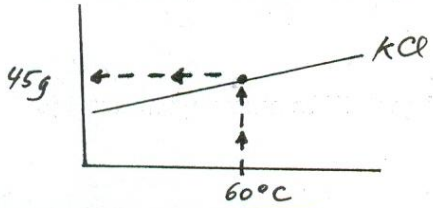


@ 22 °C



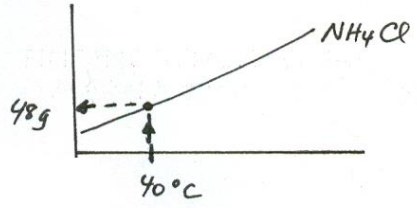
FINDING TYPE OF SOLUTION

5a) 40 grams of KCl are dissolved in 100 grams of water at 60°C. What type of solution is this, unsaturated, saturated or supersaturated?



Since 45g is saturated, 40g is unsatd

5b) 50 grams of NH_4Cl are dissolved in 100 grams of water at 40°C. What type of solution is this, unsaturated, saturated or supersaturated?

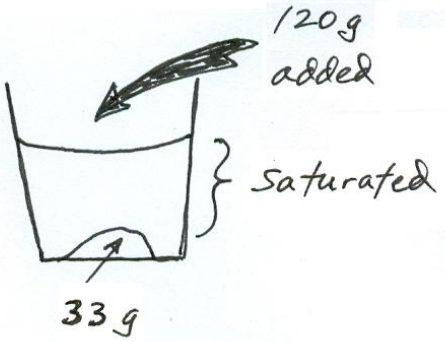


Since 48g is saturated, 50g is supersatd.

THE "BIG" PROBLEM

6a) If you add 120 grams of $NaNO_3$ to 100 grams of H_2O at 20°C, will all of it dissolve?
b) If not, how much of the $NaNO_3$ remains undissolved?
c) What type of solution is this unsaturated, saturated or supersaturated?
d) Without adding more water, what can you do to make all 120 grams of $NaNO_3$ dissolve?
e) After dissolving all of the $NaNO_3$, what type of solution do you have then?

a) Since the $S_{NaNO_3 \text{ @ } 20°C} \approx \frac{87\,g}{100\,g\ H_2O}$, only 87 g of the 120 g added dissolve.



b) 120 g − 87 g = 33 g undissolved

c) Since max' dissolved at 20 °C, it's saturated.

d) {↑T, ↑$S_{(s)}$} Therefore, increase temp to about 55 °C.

e) Saturated at 55 °C.

REMEMBER: Every point on the curve is saturated.

DOING A RATIO

7) At 70°C, how many grams of $KClO_3$ will saturate 200 grams of H_2O?

$S_{KClO_3 \text{ @ } 70°C} \approx \frac{37\,g}{100\,g\ H_2O}$ → $\frac{37}{100} = \frac{x}{200}$

$100x = 200(37)$

$100x = 7400$

$x = \frac{7400}{100} = 74\,g$

Double Solvent,
Double Solute