

## CHEMISTRY DAILY PLAN

**Class:**

**Date:**

**Subject:** Solubility

**Time:**

Solubility is the maximum amount of substance, which is dissolved by given solvent. In solubility we generally discussed maximum amount of substance which dissolve in 100 g water. Solubility of A is 44 g / 100 g H<sub>2</sub>O at 30 °C, means, maximum 44 g salt of A dissolve in 100 g water at 30 °C.

**Example 1:** When 40 g of NaCl is added in 60 g water, 4 g NaCl remains undissolved. What is the solubility of NaCl in 100 g water at the same temperature?

40 g NaCl is added, 4 g NaCl is undissolved so: 40 - 4 = 36 g NaCl is dissolved in 60 g water

$$\begin{array}{l} 60 \text{ g H}_2\text{O} \\ 100 \text{ g H}_2\text{O} \end{array} \begin{array}{l} \times \\ \times \end{array} \begin{array}{l} 36 \text{ g NaCl} \\ x \text{ g NaCl} \end{array}$$

$$x = \frac{100 \times 36}{60} = 60 \text{ g NaCl}$$

**Example 2:** The solubility of A is 25 g in 100 g water at 20 °C. How many grams of A must be added to saturate a solution which contains 380 g water and 70 g of salt A?

Lets calculate how many grams of A must be at saturated soln, which contains 380 g H<sub>2</sub>O

$$\begin{array}{l} \text{In } 100 \text{ g H}_2\text{O} \\ \text{In } 380 \text{ g H}_2\text{O} \end{array} \begin{array}{l} \times \\ \times \end{array} \begin{array}{l} 25 \text{ g A} \\ x \text{ g A} \end{array}$$

$$x = \frac{380 \times 25}{100} = 95 \text{ g A}$$

Normally for saturated soln in 380 g water, there must be 95 g salt of A.

The solution contains already 70 g salt of A So, we should find:

95 - 70 = 25 g salt of A must be add to saturate.

**Example 3:** The solubility of KNO<sub>3</sub> at 60 °C in 100 g water is 110 grams. How many grams of KNO<sub>3</sub> are there in 525 g saturated solution of KNO<sub>3</sub> at 60 °C ?

In 100 g water there are 110 g KNO<sub>3</sub> so:

In 210 (H<sub>2</sub>O + KNO<sub>3</sub>) saturated soln there are 110 g KNO<sub>3</sub>

$$\begin{array}{l} \text{In } 210 \text{ g} \\ \text{In } 525 \text{ g} \end{array} \begin{array}{l} \times \\ \times \end{array} \begin{array}{l} 110 \text{ g KNO}_3 \\ x \text{ g KNO}_3 \end{array}$$

$$x = \frac{525 \times 110}{210} = 275 \text{ g KNO}_3$$