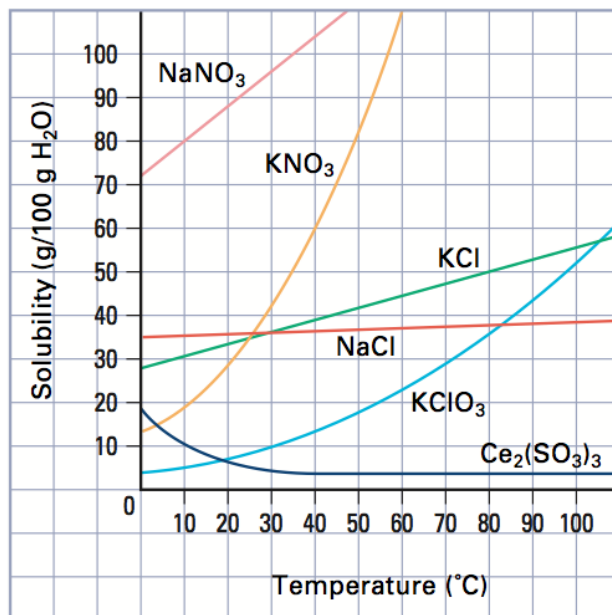


G11 Chemistry: Class 11 Homework

1. The graph below shows the solubility of various substances plotted against the temperature of the solution. **[8 marks]**



- Which substance decreases in solubility as the temperature increases?
- Which substance is least soluble at room temperature? Which substance is most soluble at room temperature (25°C)?
- The solubility of which substance is least affected by a change in temperature?
- At what temperature is the solubility of potassium chlorate equal to 40 g/100 g of water?
- 20 mL of a saturated solution of potassium nitrate at 50°C is cooled to 20°C. Approximately what mass of solid will precipitate from the solution?

2. What is the concentration in percent (m/v) of each solution? **[4 marks]**

a. 14.2g of potassium chloride, KCl dissolved in 450ml of solution

b. 31.5g of calcium nitrate, $\text{Ca}(\text{NO}_3)_2$ dissolved in 1.80L of solution

3. At 25°C, a saturated solution of carbon dioxide gas in water has a concentration of 0.145% (m/v). What mass of carbon dioxide is present in 250ml of the solution? **[2 marks]**

4. If 55g of potassium hydroxide is dissolved in 100g of water, what is the concentration of the solution expressed as mass/mass percent? **[2 marks]**

5. Stainless steel must contain at least 10.5% chromium. What mass of chromium is needed to make a stainless steel fork with a mass of 60.5g? **[2 marks]**

6. 18-carat white gold is an alloy. It contains 75% gold, 12.5% silver and 12.5% copper. A piece of jewelry made of 18-carat white gold has a mass of 20g. How much pure gold does it contain? **[2 marks]**
7. Milk fat is present in milk. Whole milk usually contains about 5.0% milk fat by volume. If you drink a glass of milk with a volume of 250ml, what volume of milk fat have you consumed? **[2 marks]**
8. The average adult human body contains about 5L of blood. Of this volume, only about 0.72% consists of leukocytes. What volume of pure leukocyte cells is present in the body of a small child with only 2.5L of blood? **[2 marks]**
9. Symptoms of mercury poisoning become apparent after a person has accumulated more than 20mg of mercury in the body. **[6 marks]**
- a. Express this amount as ppm for a 60kg person
 - b. Express this amount as ppb
 - c. Express this amount as a (m/m) percent

10. A student dissolves 30.46g of AgNO_3 in water to make 500mL of solution. What is the molar concentration of the solution? **[3 marks]**
11. A 100ml bottle of skin lotion contains a number of solutes. One of these solutes is ZnO . The concentration of ZnO in the skin lotion is 0.915mol/L. What mass of zinc oxide is present in the bottle? **[3 marks]**
12. What volume of 0.500 mol/L calcium acetate $\text{Ca}(\text{CH}_3\text{COO})_2$ (aq) contains 0.300 mol of acetate ions? **[3 marks]**
13. A sample of 0.6760g of an unknown compound containing barium ions (Ba^{2+}) is dissolved in water and treated with an excess of Na_2SO_4 . If the mass of the BaSO_4 precipitate formed is 0.4105g, what is the percent by mass of Ba in the original unknown compound? **[4 marks]**