Exercise no. 4

Permanganometric determination of calcium

Add about 100 ml of distilled water to the beaker containing Ca^{2+} ions and mix the solution with a baguette. Then, add 5 mL of HCl solution (1:1), 3 drops of methyl orange and 50 mL of saturated solution of ammonium oxalate. Heat the solution to 80 °C and slowly add ammonia (1:2) till the solution colour becomes yellow.

Allow the solution containing precipitated CaC_2O_4 to stand half an hour. Then, filter the solution through a filter paper. To wash out chloride ions and free oxalate ions, wash the precipitate with 3 portions of water with the addition of ammonia.

Add 100 mL of 1 M H_2SO_4 to the baker. Place the filter with CaC_2O_4 precipitate in the baker and stick to the wall of the vessel. The sediment should be rinsed with distilled water. Heat the solution to 70 °C and titrated with 0.1 N $KMnO_4$ to **slightly pink colour** that persists for 15 to 20 sec. Then place the filter into the solution using baguette and add 0.1 N $KMnO_4$ again to obtain a slightly pink colour. Calculate the amount of calcium present in the sample using formula:

$$X = V_{KMnO4} \cdot C_{1/5\ KMnO4} \cdot 20.04$$