1. Dissolved oxygen is usually determined by the Wrinkler method:

   Step 1: oxygen is fixed by $Mn(OH)_2$ precipitate

   $2\ Mn(OH)_2(s) + O_2(aq) \rightarrow 2\ MnO(OH)_2(s)$

   Step 2: Iodine is formed when the precipitate is dissolved in acid

   $2MnO(OH)_2 + 4\ I^-(aq) + 6H^+ \rightarrow Mn^{2+}(aq) + 2I_2(aq) + 3\ H_2O$

   Step 3: Thiosulfate is used, with a starch indicator, to titrate the iodine

   $2\ S_2O_3^{2-}(aq) + I_2 \rightarrow S_4O_6^{2-}(aq) + 2\ I^-(aq)$

   A 250 mL sample contains *x* μmol L^{-1} O_2. It requires 5 mL of 0.01 mol L^{-1} thiosulfate to complete the titration, what is the original concentration of O_2? (20%)

2. Describe (1) the principle of chromatography (2) HETP (3) HPLC (30%)

3. Calculate the pH of a solution that is 0.07 F in NH_3 and 0.28 F in NH_4Cl. The basic dissociation constant for NH_3 is 1.76×10^{-5}. (20%) (give approx. pH value)

4. Explain (1) atomic absorption spectrometry (2) inductively coupled plasma atomic emission spectrometry (3) ICP-MASS (30%)

試題隨卷繳回