

淡江大學 106 學年度日間部轉學生招生考試試題 ²⁻⁴

系別：水環系環境工程組二年級

科目：化學

4-1

考試日期：7月20日(星期四) 第1節

本試題共 二 大題， 1 頁

第一部分：解釋名詞（每題5分，共30分）

1. Osmotic pressure
2. Isotope
3. Henry's law
4. Colloid
5. Hard water
6. Indicator

第二部分：問答題與計算題（共70分）

1. At 60 °C, K_w is 1×10^{-13} . Predict whether the autoionization reaction of H_2O is exothermic or endothermic and explain your answer. (10 pts)
2. Consider the titration of 100 mL of 0.05 M NH_3 ($K_b = 1.8 \times 10^{-5}$) by 0.1 M HCl. (40 pts)
Calculate the pH of the resulting solution after the following volumes of HCl have been added.
(a) 0 mL (b) 25 mL (c) 50 mL (d) 60 mL
3. Balance the following equation using the half-reaction method: (10 pts)
 $Ag_{(s)} + CN^-_{(aq)} + O_{2(g)} \rightarrow Ag(CN)_2^-_{(aq)}$ in a basic solution
4. A student added 50 mL of an NaOH solution to 100 mL of 0.4 M HCl. The solution was then treated with an excess of aqueous chromium(III) nitrate, resulting in formation of 2.06 g of precipitate. Determine the concentration of the NaOH solution. (Cr = 52.0, Cl = 35.45) (10 pts)