

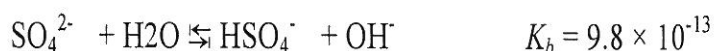
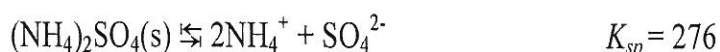
國立臺灣師範大學 103 學年度碩士班招生考試試題

科目：分析化學

適用系所：化學系

注意：1.本試題共 1 頁，請依序在答案卷上作答，並標明題號，不必抄題。2.答案必須寫在指定作答區內，否則不予計分。

1. For a 0.1M solution of base that has 2.0% hydrolyzed ($\alpha=0.020$), find the K_b for the base. (5 pt)
2. Why is the pH of a buffer nearly independent of concentration? (5 pt)
3. When ammonium sulfate dissolves, both the anion and cation have acid-base reaction:



- (a) Write a charge balance for this system (5 pt)
 - (b) Write a mass balance for this system (5 pt)
 - (c) Find the concentration of $\text{NH}_{3(\text{aq})}$ if the pH is fixed at 9.25 (10 pt)
4. What is the definition of ionic strength? Find the ionic strength of 0.01 M Na_2SO_4 ? (10 pt)
 5. Please explain the procedures and reactions of Kjeldahl nitrogen analysis? [note: for protein] (10 pt)
 6. What is “standard hydrogen electrode”? Show the structure. (10 pt)
 7. Please write the Nernst equation and predict the voltage change (ΔV) when the concentration of a solution containing 0.001M $[\text{Ag}^+]$ is increased to 0.005M $[\text{Ag}^+]$. (10 pt)
 8. Show the instrument structure of Gas Chromatograph – Flame Ionization Detector. (10 pt)
 9. Explain the working principle of “Time-of-flight” mass spectrometer. (10 pt)
 10. What is inductively coupled plasma atomic emission (ICP-AE) spectroscopy? (10 pt)