

國立高雄師範大學 104 學年度學士班轉學生招生考試試題

系所別：化學系三年級

科 目：分析化學

※注意：1.不必抄題，作答時請將試題題號及答案依照順序寫在答案卷上，於本試題上作答者，不予計分。

2.限用藍色或黑色之鋼筆、原子筆作答，以鉛筆或其他顏色作答者不予計分。

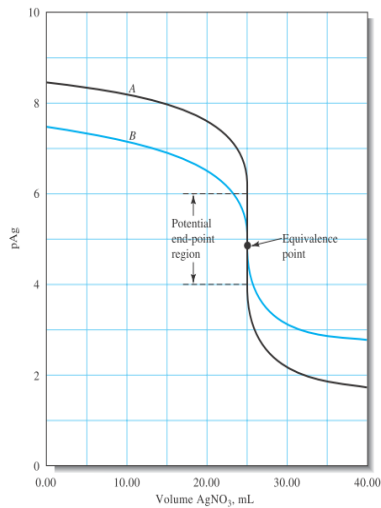
1. Calculate the solubility of $\text{Ba}(\text{IO}_3)_2$ in a solution prepared by mixing 200 mL of 0.0100 M $\text{Ba}(\text{NO}_3)_2$ with 100 mL of 0.100 M NaIO_3 ? (10%)
2. What will be the molar analytical concentration of Na_2CO_3 (106 g/mol) in the solution produced when 25.0 mL of 0.200 M AgNO_3 (275.7 g/mol) is mixed with 50.0 mL of 0.0800 M Na_2CO_3 ? (10%)
3. Write (a) the mass-balance expressions and (b) the charge-balance equations for 0.2 M Na_2HPO_4 . (10%)
4. Calculate the p-value for each of the indicated ions in a solution that is 1.62×10^{-7} M in $\text{K}_4\text{Fe}(\text{CN})_6$ and 5.12×10^{-7} M in KOH. (10%)
5. Name three types of systematic errors. (10%)

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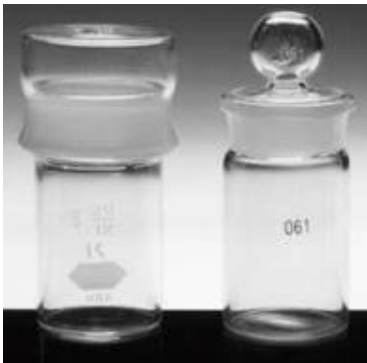
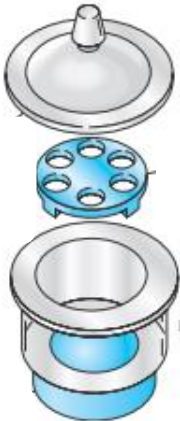




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6. In the graph below have two titration curves. (a) Titration curve for 50.00 mL of 0.00500 M NaCl titrated with 0.01000 M AgNO₃ is Curve ____; (b) Titration curve for 50.00 mL of 0.05000 M NaCl titrated with 0.1000 M AgNO₃ is Curve _____. (10%)



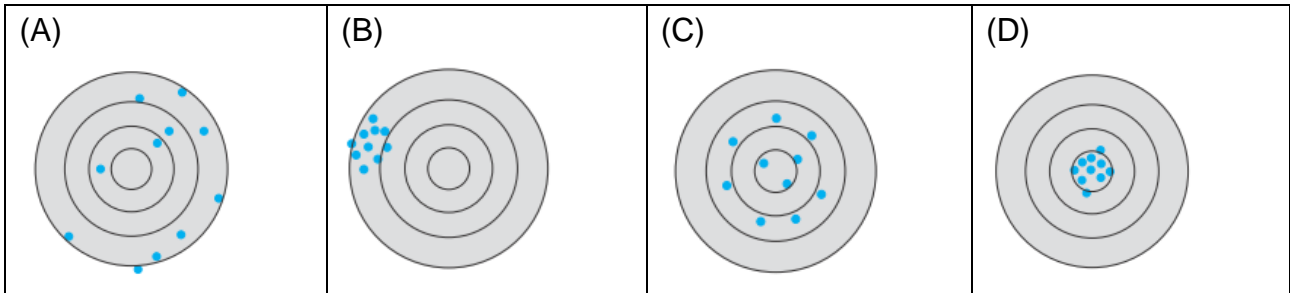
7. Give both Chinese and English name of the following apparatus. (10%)

<p>(A)</p> 	<p>(B)</p> <p>(a) </p> <p>(b) </p>
<p>(C)</p> <p>Color code</p> <p>(a) </p> <p>(b) </p>	<p>(D)</p> 

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8. Using the illustration, please indicate the accuracy and precision. (a) High accuracy and high precision is _____; (b) High accuracy and poor precision is _____; (c) Poor accuracy and poor precision is _____; and (d) Poor accuracy and high precision is _____. (10%)



9. What is the pH of a 2.00×10^{-8} M HCl solution? (10%)

10. There are three types of errors in chemical analysis: (I) random (indeterminate) error, (II) systematic (determinate) error, and (III) gross error. Method B has some error so that the average x_B , which estimates μ_B , differs from the accepted value μ_0 . The bias is given by $Bias = \mu_B - \mu_0$. Curve A is the frequency distribution for the accepted value by a method without bias. Curve B illustrates the frequency distribution of results by method B that has a significant bias due to a type of error. (a) What type of error which might be involved in method B, (I), (II), or (III)? (b) Give three sources which might contribute to this type of error. (10%)

