

國立臺北科技大學 103 學年度碩士班招生考試

系所組別：3711 分子科學與工程系有機高分子碩士班甲組

第三節 分析化學 試題 (選考)

第一頁 共一頁

注意事項：

1. 本試題共十題，配分共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

2014 Analytical Chem Exam (10 questions, 10 point each; please write down your procedures and answers on the answer sheet)

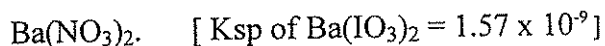
1. Balance equation



2. Balance equation



3. Calculate the molar solubility of $\text{Ba}(\text{IO}_3)_2$ (487g/mol) in a solution that is 0.02 M in



4. Calculate the solubility of $\text{Ba}(\text{IO}_3)_2$ in a solution prepared by mixing 200 ml of 0.100 M $\text{Ba}(\text{NO}_3)_2$ with 100 ml of 1.00 M NaIO_3 (I:127, Ba:137.3, Na: 23, O: 16; K_{sp} of $\text{Ba}(\text{IO}_3)_2 = 1.57 \times 10^{-9}$).

5. What CrO_4^{2-} conc. is required to initiate precipitation of Ag_2CrO_4 from a solution that is 3.41×10^{-3} M in Ag^+ ? (Ag_2CrO_4 $\text{K}_{\text{sp}} = 1.2 \times 10^{-12}$; Ag:108, Cr:52, O:16)

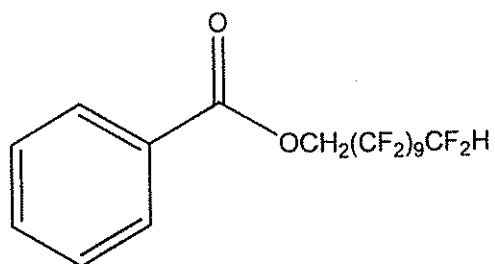
6. Calculate the solubility of $\text{Fe}(\text{OH})_3$ in water. (Hint: you can proceed by using the systematic approach), [$\text{Fe}(\text{OH})_3$ $\text{K}_{\text{sp}} = 2 \times 10^{-39}$]

7. Calculate 25 °C the pH of the solution that contains 8.00% (w/w) NaOH and has a density of 1.5g/ml

8. What is the pH of a solution that is 0.400 M in formic acid and 1.00 M in potassium formate? (K_a of $\text{HCOOH} = 1.80 \times 10^{-4}$)

9. Please draw the schematic diagram of GC/MS spectrometer and also give the description of the instrument.

10.



. (atomic wt.: C:12, H:1, O: 16, F:19) One compound shown in above figure was injected to GC/MS. The mass diagram shows that $m/z= 50, 51, 77, 100, 105$ and 636. Please give their respective fragments?

[e.g.: when $m/z=50$: fragments: CF_2^+]