

# 國立高雄師範大學 101 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

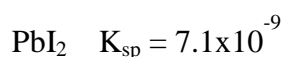
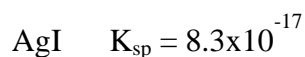
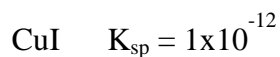
※注意：1.不必抄題，作答時請將試題題號及答案依照順序寫在答案卷上，於本試題上作答者，不予計分。

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. Please define the following terms: (30%)

- (1) Systematic error
- (2) Precision
- (3) Population mean
- (4) Differentiating solvent
- (5) Amphiprotic species
- (6) Mohr method

2. The solubility products for a series of iodides are (10%)



List these four compounds in order of decreasing molar solubility in

- (1) water
  - (2) 0.10 M NaI
3. A 0.6407 g sample containing chloride (35.5 g/mol) and iodide (126.9 g/mol) ions gave a silver halide precipitate weighing 0.4430 g. This precipitate was then strongly heated in a stream of  $\text{Cl}_2$  gas to convert the AgI (234.8 g/mol) to AgCl (143.4 g/mol); on completion of this treatment, the precipitate weighed 0.3181 g. Calculate the percentage of chloride and iodide in the sample. (10%)

(背面有題 續翻背面)

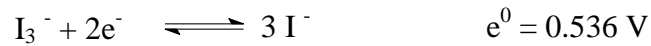
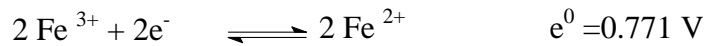
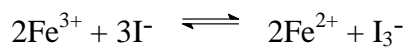
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4. A 0.8040 g sample of an iron ore is dissolved in acid. The iron is then reduced to  $\text{Fe}^{2+}$  and titrated with 47.22 mL of 0.02242 M  $\text{KMnO}_4$  solution. Calculate the results of this analysis in terms of (a) %Fe (55.847 g/mol) and (b) % $\text{Fe}_3\text{O}_4$  (231.54 g/mol).  $\text{MnO}_4^- + 5\text{Fe}^{2+} + 8\text{H}^+ \rightarrow \text{Mn}^{2+} + 5\text{Fe}^{3+} + 4\text{H}_2\text{O}$  (10%)

5. 25 mL of 0.1 M maleic acid ( $\text{HOOC-CH=CH-COOH}$ ) was titrated with 0.1 M NaOH. Calculate the pH of the solution after the addition of (a) 0 mL (b) 25 mL (c) 50 mL (d) 51 mL (20%)

6. Please calculate the equilibrium constant for the reaction: (10%)



7. Please write out what is a buffer solution, and what are its properties? (10%)