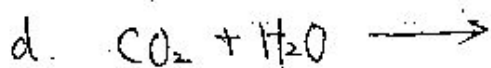
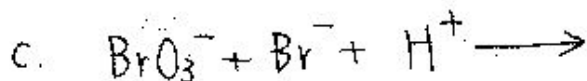
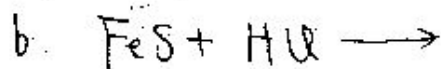
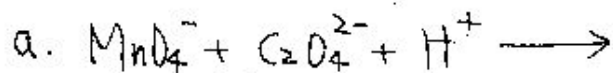


1. (30%) 解釋下列專有名詞 (每小題 5%)

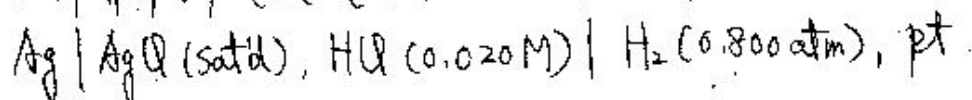
- Brønsted-Lowry acid
- Le Chatelier principle
- Beer's law
- Nernst equation
- Debye-Hückel equation
- Conditional formation constant

2. (20%) 寫程式平衡 (每小題 5%)



3. (10%) 計算  $\text{PbCO}_3$  ( $K_{sp} = 7.4 \times 10^{-14}$ ) 於  $\text{pH} = 7.0$  buffer 下，在 (a) 純水中其溶解度？ ( $\text{H}_2\text{CO}_3$  的  $K_1 = 4.45 \times 10^{-7}$ ,  $K_2 = 4.7 \times 10^{-11}$ )。

4. (10%) 計算下列電池電位，並繪出其圖型。

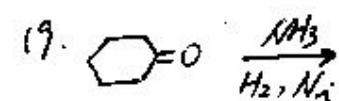
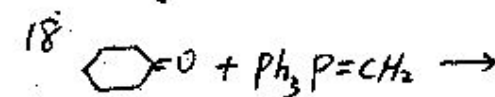
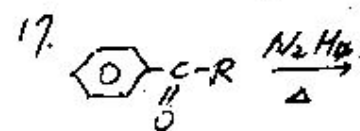
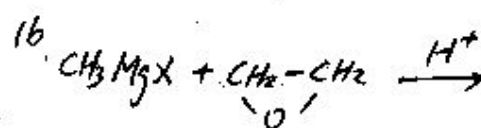
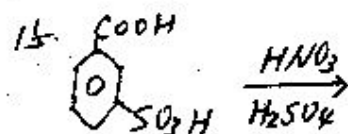
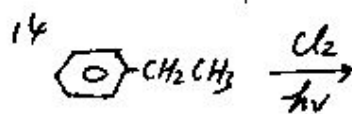
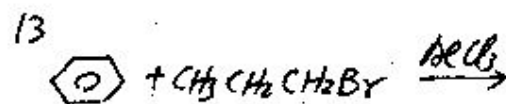
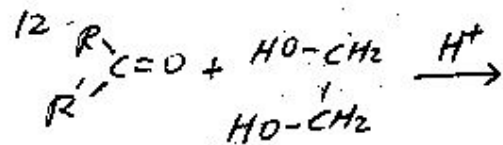
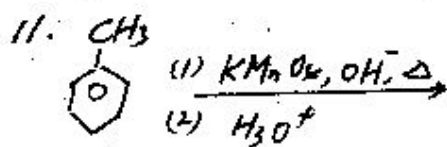
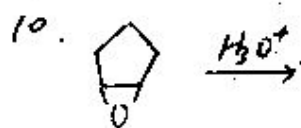
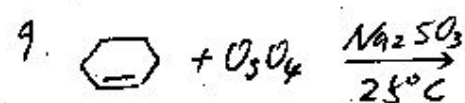
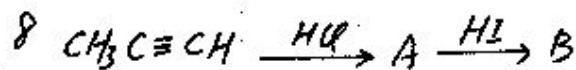
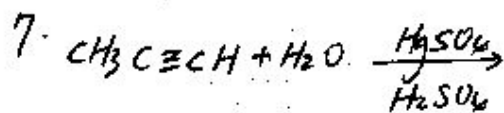
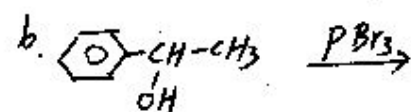
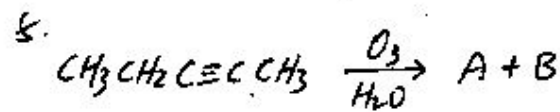
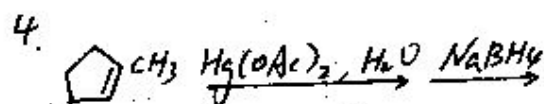
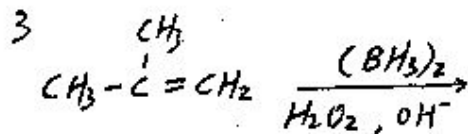
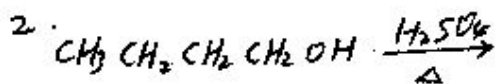
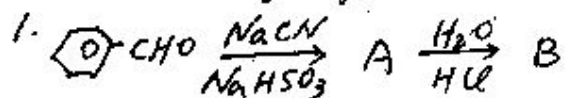


5. (10%) AA 使用 hydride generator 測試原理之目的為何？

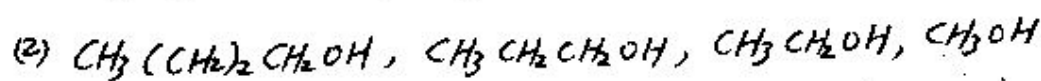
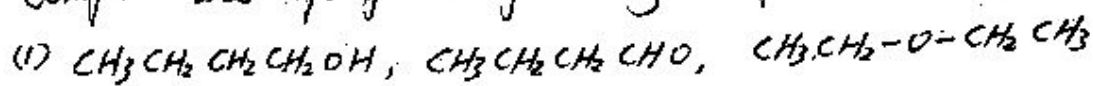
6. (10%) 說明 DSC, DTA 與 TGA 測試原理與應用上的差異。

7. (10%) GC 使用 columns 有 packed, capillary 與 wide bore, 說明其使用原理與應用上的差異。

A. Give the major products : 88% (每個答案4分)



B. Compare the b.p. of the following compounds: 4%



C. CC(O)R will give positive iodoform reaction, describe the mechanism of iodoform reaction. 4%

D. A compound reacts with HIO\_4 to produce RCHO, HCOOH and R'CHO. What's the compound? 4%

\* 每一題目均需寫出推理過程, 否則不予計分。

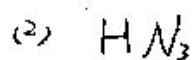
一. For each of the following compound,

8% (a) predict and sketch the structure.

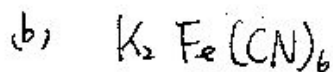
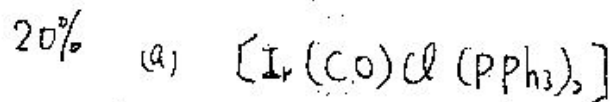
8% (b) assign the point group

7% (c) label the oxidation number for each atom.

7% (d) label the formal charge for each atom.

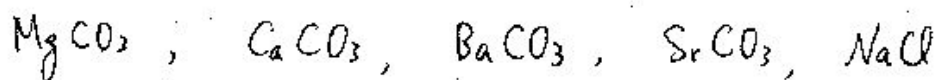


二. Give chemical names for the following:



三. Predict the order of solubility in water and

10% explain the factors involved.



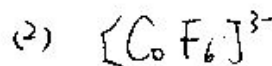
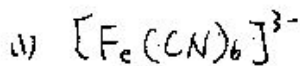
四. Determine the ground terms for the following

20%



五. Determine which of the following is paramagnetic,

20% explain your choice, and estimate its magnetic moment.



中國文化大學八十九學年度碩士班入學考試

所(組)別：應用化學研究所

考試科目：物理化學

- I. List four important postulates for the quantum mechanics. (25)
- II. Describe principles and applications of laser. (25)
- III. Describe Haber process, including condition, catalyst and mechanisms, for the synthesis of ammonia. (25)
- IV. Illustrate H, G and the second law of thermodynamics. (25)

(第一頁,共一頁)

1. Give the general chemical structures of
  - a. Cellulose [8%]
  - b. Protein [8%]
  - c. Triacylglycerol [8%]
  - d. Deoxyribonucleic acids [8%]
  - e. Fe [II] Heme liganded to histidine and O<sub>2</sub> [8%]
2. Give the diagram showing the initiation of polypeptide synthesis in *E. Coli* [with the complex formations of ribosomal 30s and 50s subunits, mRNA, fmet-tRNA<sup>fmet</sup>, GTP and initiation factors, etc.] [30%]
3. Give the diagram of the citric acid cycle [give the chemical structure for each intermediate] [30%]

(第一頁.共一頁)