

大葉大學九十二學年度轉學招生考試試題紙

系 組 別	日 \ 第二部	年級	考 試 科 目 (中 文 名 稱)	考試日期	節次	備註
生物產業科技學系 環保特化食品生物科技組	日	二	普通化學	7月23日	四	可使用計算機 共二頁

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶） 13=30 14=50

(一) 解釋名詞：15%

- 1、reducing agent：
- 2、octet rule：
- 3、enthalpy：
- 4、reaction rate：
- 5、activation energy：

(二) 化學式：12%

- 1、hydrogen bromide
- 2、ethyl alcohol
- 3、nitric oxide
- 4、calcium sulfide

(三) 計算題：73% (詳列計算步驟否則一概不計分)

1、The solubility of potassium chloride is 37.0 g/100g water at 30°C. Its solubility at 70°C is 48.3 g/100g water. (10%)

- (a) Calculate the mass of potassium chloride that dissolves in 48.6 g of water at 30°C
- (b) Calculate the mass of water required to dissolve 52.0 g of potassium chloride at 70°C

2、Aluminum reacts with sulfur gas to form aluminum sulfide. Initially, 1.18 mol of aluminum and 2.25 mol of sulfur are combined. (16%)

- (a) Write a balanced equation for the reaction.
- (b) What is the limiting reactant?
- (c) What is the theoretical yield of aluminum sulfide in moles?
- (d) How many moles of excess reactant remain unreacted?

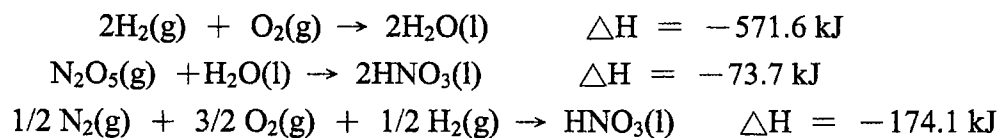
3、Give the symbol of the atom with the following orbital diagram (8%)

- | | | | | |
|------|------|--------------|------|-------------|
| 1s | 2s | 2p | 3s | 3p |
| (↑↓) | (↑↓) | (↑↓)(↑↓)(↑↓) | (↑↓) | () () () |
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4、Draw Lewis structures for the following species. (a) H₃C-C-OH (b) F₂C-CCl₂ (c) HCO₂⁻ (15%)

5、A gas effuses 1.55 times faster than propane (C₃H₈) at the same temperature and pressure. What is the molar mass of the gas? (6%)

6、Given the following thermochemical equations



Calculate ΔH for the formation of one mole dinitrogen pentoxide from its element in their stable state at 25°C and 1 atm. (6%)

7、For the reaction $\text{C}_2\text{H}_4(\text{g}) + \text{H}_2(\text{g}) \rightarrow \text{C}_2\text{H}_6(\text{g})$

the activation energy is 181 kJ/mol. The rate constant at 500°C is 0.025 L/molxs,

- (a) At what temperature is the rate constant one-third its value at 500°C? (6%)
- (b) What is the rate constant at 825°C? (6%)