

淡江大學 96 學年度轉學生招生考試試題

11-1

系列：化學學系二年級

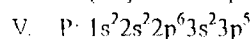
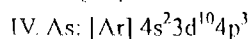
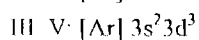
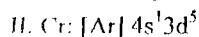
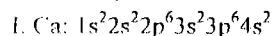
科目：普通化學

本試題共 2 頁 1

*****請按題序作答並標示清楚答案之題號*****

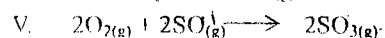
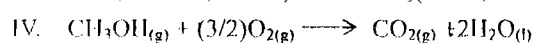
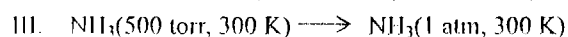
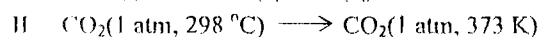
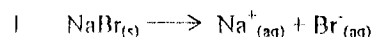
第一部份：選擇題（每題 5 分，共 25 分）

1 How many of the following electron configurations for the species in their ground state are **wrong**?



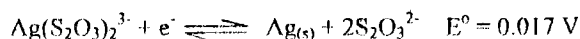
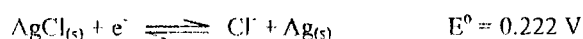
(A) 1 (B) 2 (C) 3 (D) 4 (E) 5

2 How many of the following result(s) in an increase in the entropy of the system?



(A) 1 (B) 2 (C) 3 (D) 4 (E) 5

3 Which of the following is the strongest oxidant?



(A) Ag

(B) AgCl

(C) $\text{Ag}(\text{S}_2\text{O}_3)_2^{3-}$

(D) Ag^+

(E) Cl⁻

4 Which ion is planar?

(A) NH_4^+

(B) SO_3^{2-}

(C) CO_3^{2-}

(D) ClO_3^-

(E) all are planar

本試題雙面印製

請注意背面尚有試題

系別：化學學系二年級

科目：普通化學

本試題共 2 頁 2

5. Hydrogen bonding between C=O groups and N—H groups in the backbone of a protein determines the _____.
- (A) primary structure.
 (B) secondary structure.
 (C) tertiary structure.
 (D) quaternary structure.
 (E) all of these.

第二部份：解釋名詞（每題 5 分，共 30 分）

1. Colligative property
2. Electronegativity
3. Heisenberg uncertainty principle
4. Dipole moment
5. State function
6. Condensation polymerization

第三部份：問答題（共 45 分）

1. The initial concentration of N_2O_5 for the following first-order reaction is 1 (mole/L).

$$2\text{N}_2\text{O}_5 \longrightarrow 4\text{NO}_2 + \text{O}_2$$
 - (a) Derive the integrated rate law to express the reactant concentration $[\text{N}_2\text{O}_5]$ as a function of time. (Use k as the rate constant in your derivations.) (6%)
 - (b) Derive $t_{1/2}$, the reaction half-life of N_2O_5 . (4%)
2. Describe how to use the acid-base titration method to prepare a buffer solution with high buffer capacity. (10%)
3.
 - (a) Write down the Schrödinger's equation and define each term in the equation. (10%)
 - (b) What is the physical meaning of a wave function? (5%)
4. Derive the relation between the cell potential E_{cell} and the cell reaction quotient Q for a Galvanic cell. Define each term in your derivation. (10%)