

淡江大學 110 學年度日間學制寒假轉學生招生考試試題

系別：理學院尖端材料科學學士學位學程二年級

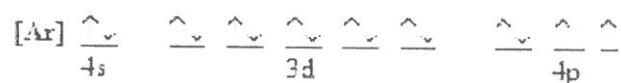
科目：普通化學

考試日期：1 月 19 日(星期三) 第 2 節

本試題共 2 大題， 1 頁

一、單選題 (每題 4 分，共 40 分)

- The number of orbitals in a d subshell is A) 1 B) 2 C) 3 D) 5 E) 7.
- Which ground-state atom has an electron configuration described by the following orbital diagram? A) P B) Ge C) Se D) Te E) none of these.



- How many unpaired electrons does a ground-state atom of sulfur have? A) 0 B) 1 C) 2 D) 3 E) 4.
- Which of the following ground-state atoms is diamagnetic? A) Ca B) As C) Cu D) Fe E) none of these.
- Which one of the following is most likely to be an ionic compound? A) ClF_3 B) FeCl_3 C) NH_3 D) PF_3 E) SO_3
- Calculate the volume occupied by 35.2 g of methane gas (CH_4) at 25°C and 1.0 atm. $R = 0.08206 \text{ L}\cdot\text{atm}/\text{K}\cdot\text{mol}$. A) 0.0186 L B) 4.5 L C) 11.2 L D) 49.2 L E) 53.7 L
- Which of the bonds below would have the *greatest* polarity? A) Si—P B) Si—S C) Si—Se D) Si—Cl E) Si—I
- Which one of the following elements is a transition element? A) Sr B) Pb C) As D) Fe E) H
- What is the number of lone electron pairs in the N_2 molecule? A) 1 B) 2 C) 3 D) 4 E) 5
- The total number of bonding electrons in a molecule of formaldehyde (H_2CO) is A) 3 B) 4 C) 6 D) 8 E) 18.

二、問答及計算題 (60 分)

- Write the Lewis structure of (a) Cl^- (b) CO_3^{2-} (c) water molecule (d) nitrate ion. (16 分)
- What is the formula for the ionic compound formed by (a) magnesium and iodine; (b) aluminum and oxygen? (8 分)
- Give any one example for strong electrolyte, weak electrolyte and nonelectrolyte. (9 分)
- Based on the solubility rules, classify which of the followings are soluble in water and which are insoluble in water? NaCl , AgCl , PbSO_4 . (9 分)
- What is the molar concentration of chloride ions in a solution prepared by mixing 100 mL of 2.0 M KCl with 50 mL of a 1.5 M CaCl_2 solution? (8 分)
- What is the equation of chemical reaction that involved in the formation of scale (水垢)? What is the strategy to remove the scale? (10 分)