

大同大學 106 學年度(寒)轉學入學考試試題

考試科目:普通化學

系別:材料工程學系

第 全 頁

註:本次考試 不可以參考自己的書籍及筆記; 不可以使用字典; 不可以使用計算器。

1. 請依序寫出各英文元素之符號: (25%)
Aluminium, Iron, Lead, Lithium, Mercury, Magnesium, Nickel, Platinum,
Potassium, Silver, Sodium, Tin, Tungsten, Zinc, Argon, Copper, Boron,
Gold, Oxygen, Zirconium, Vanadium, Barium, Cobalt, Phosphorus, Manganese,
2. Answer the follow questions: (15 %)
 - (a) Red light or violet light: Which has greater energy? Which has the longer wavelength?
Which has higher frequency?
 - (b) Which atoms in each of following pairs has a larger radius?
(1) Na or K (2) Sn or I (3) Li or F (4) Al or S
 - (c) Which atom or ion in each of following pairs has a larger radius?
(1) O or O^{2-} (2) Fe or Fe^{3+} (3) S or S^{2-} (4) Ni or Ni^{2+}
3. Characterize bonds between the two atoms as covalent or ionic? (10%)
(1) Ca and Cl (2) S and Cl (3) K and S (4) C and F (5) Na and Cl
4. Which atom or ion in the following pairs would you expect to be larger radius? (10%)
(1) I or I^{-1} (2) Au or Au^{3+} (3) As or As^{2-} (4) Sr or Sr^{2+} (5) Ca or Ca^{2+}
5. Which of the substances PH_3 , CaO, CO, SO_2 , H_2O , AlF_3 , CCl_4 , $PdCl_2$, Li_2O , and CsBr are: (10%)
(a) Largely ionic? (b) Nonpolar covalent? (c) Polar covalent?
6. What the chemical structure of follow molecules and indicates which one is polarity? (5%)
Acetylene, chloroform, carbon dioxide, carbon tetrachloride, benzene
7. What shape do you expect for each of following molecules? (10%)
(a) $SnCl_2$ (b) PCl_3 (c) $TeBr_4$ (d) $COCl_2$ (e) CrO_4^{2-}
8. The physical properties of a gas can be defined by four variables: P: pressure, T: temperature, V: volume, and n: number of moles. (10 %)
 - (a) 寫出 Charles's Law, Boyle's Law, and Avogadro's Law 定律的 P, V, n 的相互關係及說明?
 - (b) 寫出 ideal gas 的 P, V, n, R 相互關係?
9. Which one of follow gases is closest to being an ideal gas: (5 %)
(a) CO_2 (b) He (c) CH_4 (d) NH_3 (e) N_2