

# 大同大學 104 學年度寒轉學入學考試 試題

考試科目：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. Which member of each of the following pairs of compounds has the higher boiling point ? (10%)  
(a)  $O_2$  or  $N_2$  (b)  $SO_2$  or  $CO_2$
2. Translation the sentence of the following : (10%)  
(a) Cell potential in a voltaic cell is the electrical potential energy difference between the cathode and anode.  
(b) Isotopes are atoms of the same element (same Z) but different mass numbers (A).
3. Please describe the word of the following : (10%)  
(a) Anode and Cathode  
(b) Reduction and Reducing agent
4. Which substance has the higher entropy? (10%)  
(a) Dry ice (solid  $CO_2$ ) at  $-78^\circ C$  or  $CO_2(g)$  at  $0^\circ C$   
(b) One mole of  $N_2(g)$  at 1 bar pressure or one mole of  $N_2(g)$  at 10 bar pressure (both at 298K)
5. 請寫10個週期表金屬元素的元素符號(中,英文縮寫): (20%)
6. 下列原子或離子比較大小,何者正確? (10%)  
(A)  $O^{2-} < F^-$  (B)  $Sr^{2+} < Ca^{2+}$  (C)  $N^{3-} > F^-$  (D)  $Fe^{3+} > Fe^{2+}$  (E)  $Cu^+ < Cu^{2+}$
7. 某一4克的氣體於 $0^\circ C$ , 0.25 atm 下, 其體積為11.2 L, 則其分子量為何? (10%)  
(A) 8.0 g (B) 16 g (C) 32 g (D) 48 g (E) 64 g
8. 在常溫常壓下, 將2莫耳氫氣和1莫耳氧氣混合, 並無化學反應發生, 其主要原因為何? (10%)  
(1) 平衡常數太小 (2) 反應活化能太高 (3) 反應物濃度過低 (4) 壓力太低
9. 下列化合物之鍵角, 由大至小排列(以 $>$ 表示):  $H_2O$ ,  $BeH_2$ ,  $BF_3$ ,  $CH_4$  。 (10%)