

*請在答案卡內作答

單選 50 題,共 100 分/每題二分 (答錯不倒扣)

1. Vitamin C contains the elements C, H, and O. It is known to contain 40.9% C and 4.58% H by mass. The molar mass of vitamin C has been found to be about 180. The molecular formula for vitamin C is

(A) $C_2H_3O_2$ (B) $C_3H_4O_3$ (C) $C_4H_6O_4$ (D) $C_6H_8O_6$ (E) none of these

2. When the equation $FeCr_2O_4 + K_2CO_3 + O_2 \rightarrow K_2CrO_4 + Fe_2O_3 + CO_2$ is balanced with the smallest set of integers, the sum of the coefficients is

(A) 6 (B) 9 (C) 15 (D) 24 (E) 37

3. The following acids are listed in order of decreasing acid strength in water.

$HI > HNO_2 > CH_3COOH > HClO > HCN$

According to Brønsted-Lowry theory, which of the following ions is the weakest base?

(A) I^- (B) NO_2^- (C) CH_3COO^- (D) ClO^- (E) CN^-

4. The strong acid HA is added to water. Which of the following is the strongest base in the system?

(A) HA (B) H_2O (C) H_3O^+ (D) A^- (E) H_2A^-

5. The acids $HC_2H_3O_2$ and HF are both weak, but HF is a stronger acid than $HC_2H_3O_2$. HCl is a strong acid. Order the following according to base strength.

(A) $C_2H_3O_2^- > F^- > Cl^- > H_2O$ (B) $C_2H_3O_2^- > F^- > H_2O > Cl^-$ (C) $Cl^- > F^- > C_2H_3O_2^- > H_2O$ (D) $F^- > C_2H_3O_2^- > H_2O > Cl^-$ (E) none of these

6. The two salts AgX and AgY have very similar solubilities in water. The salt AgX is much more soluble in acid than is AgY. What can be said about the relative strengths of the acids HX and HY?

(A) nothing can be said about their relative strengths (B) HY is stronger than HX (C) HX is stronger than HY (D) the acids have equal strengths (E) none of these

7. For the combustion of ethyl alcohol as described in the above equation, which of the following statements is(are) true?

$C_2H_5OH(l) + 3O_2(g) \rightarrow 2CO_2(g) + 3H_2O(l)$, $\Delta H = -1.37 \times 10^3 \text{ kJ}$

I: The reaction is exothermic; II: The enthalpy change would be different if gaseous water were produced; III: The reaction is not an oxidation-reduction one; IV: The products of the reaction occupy a larger volume than the reactants.

(A) I, II (B) I, II, III (C) I, III, IV (D) III, IV (E) I only

8. Compounds containing bismuth in the +5 oxidation state tend to be _____, and compounds containing bismuth in the +3 oxidation state tend to be _____.

(A) ionic, ionic (B) ionic, molecular (C) molecular, molecular (D) molecular, ionic (E) none of these

注意：背面有試題

參考用

