

銘傳大學 98 學年度研究所碩士班招生考試

管理研究所碩士班(甲組)

第三節

普通化學試題

(第 1 頁共 1 頁) (限用答案本作答)

可使用計算機 不可使用計算機

1. The human brain contains approximately 50 ppm iron in the fresh tissue. How much iron is presented in 200 mg of fresh human brain tissue? (5%)
2. Name three metals that are commonly referred to as the **alkaline earth metals**. (3%)
3. What volume of 0.3 M HCl solution would just neutralize 30.0 mL of 0.1 M NaOH solution? (4%)
4. Write Lewis dot formulas and describe the types of bonding in (8%)
 - a. Sodium chlorate (NaClO_3)
 - b. Phosphoric acid (H_3PO_4)
5. The molecular formula of (8%)
 - a. Calcium phosphate is:
 - b. Sodium nitrate is:
 - c. Ethanol is:
 - d. Sulfuric acid is:
6. An unknown hydrocarbon is subjected to elemental analysis. The results of this test show that the compound is 83.24% C and 16.76% H with a molar mass of 72 g/mole. What is the molecular formula of this compound? (C=12, H=1) (8%)
7. Given that: $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$, how many moles of water are produced in the complete combustion of 100.0 grams of methane (CH_4)? (8%)
8. Giving the reaction $\text{CO (g)} + \text{Cl}_2 \text{(g)} \rightarrow \text{COCl}_2 \text{(g)}$
What is the theoretical yield of phosgene if 0.322 moles of CO reacts with excess Cl_2 gas? (Cl=35.5) (8%)
9. A 2.0 L vessel is filled with 7.3×10^{-4} mol hydrogen and 6.8×10^{-4} mol oxygen. How much water can be produced? (8%)
10. According to the laws of thermodynamics, give an example of (10%)
 - a. Conversion of heat into work
 - b. Endothermic process
 - c. Entropy changes
 - d. Reaction spontaneity and free energy change (ΔG)
11. Define the term and give an example: (15%)
 - a. Hydrogen bond
 - b. Covalent bond
 - c. van der Waals forces
12. Name three polymers found in animals or plants. Describe their structures, functions and the composition of the monomers. (15%)

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