

國立成功大學

112學年度碩士班招生考試試題

編 號：280

系 所：環境醫學研究所

科 目：環境化學

日 期：0207

節 次：第 3 節

備 註：不可使用計算機

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. Give the chemical structure and describe the emission sources of the following chemicals. (20%, 4% for each)
 - (1) Endosulfan
 - (2) Short chain chlorinated paraffins (SCCPs)
 - (3) Polychlorinated naphthalene
 - (4) 3,3',4,4',5,5'-Hexa brominated biphenyls (PBBs)
 - (5) Vinyl acetate
2. Balance the following equations: (20%, 5% for each)
 - (1) $\text{Ca}(\text{H}_2\text{PO}_4)_2 + \text{NaHCO}_3 \rightarrow \text{CaHPO}_4 + \text{Na}_2\text{HPO}_4 + \text{H}_2\text{O} + \text{CO}_2$
 - (2) $\text{FeSO}_4 + \text{K}_2\text{Cr}_2\text{O}_7 + \text{H}_2\text{SO}_4 \rightarrow \text{Fe}_2(\text{SO}_4)_3 + \text{Cr}_2(\text{SO}_4)_3 + \text{K}_2\text{SO}_4 + \text{H}_2\text{O}$
 - (3) $\text{Al}_2(\text{SO}_4)_3 \cdot 14 \text{H}_2\text{O} + \text{Ca}(\text{HCO}_3)_2 \rightarrow \text{Al}(\text{OH})_3 + \text{CaSO}_4 + \text{H}_2\text{O} + \text{CO}_2$
 - (4) $\text{H}_2\text{C}_2\text{O}_4 + \text{KMnO}_4 + \text{H}_2\text{SO}_4 \rightarrow \text{CO}_2 + \text{MnSO}_4 + \text{K}_2\text{SO}_4 + \text{H}_2\text{O}$
3. Please use NH_3 as example and draw a figure to explain when NH_3 emitted to a lake, the variation of water concentration of NH_3 、 NO_2^- 、 NO_3^- in the lake under aerobic environment (20%).
4. Please describe the formation mechanism of primary and secondary $\text{PM}_{2.5}$? (20%)
5. Chlorination is the major disinfection method of tap water, please use figure and reactive equations to interpret what are (1) Breakpoint Chlorination ? (10%) (2) Free and Combined Chlorine Residuals ? (10%)