國立成功大學

115學年度碩士班招生考試試題

編　號：186

系　所：環境醫學研究所

科　目：環境化學

日　期：0204

節　次：第 3 節

注　意：1.不可使用計算機
2.請於答案卷(卡)作答，於試題上作答，不予計分。

1. PFASs (Per-and polyfluoroalkyl substances) is defined as forever chemicals, please give the classification of PFASs according to their chemical structure and describe the usage of those chemicals in the industry. (20%)

2. Please use chemical reaction equations to explain how the NOx and CFC to destroy the stratospheric ozone layer? (15%)

3. Balance the following equations: (25%, 5% for each)
   a. $MnO_2 + NaCl + H_2SO_4 \rightarrow MnSO_4 + H_2O + Cl_2 + Na_2SO_4$
   b. $FeSO_4 + K_2Cr_2O_7 + H_2SO_4 \rightarrow Fe_2(SO_4)_3 + Cr_2(SO_4)_3 + K_2SO_4 + H_2O$
   c. $Al_2(SO_4)_3 \cdot 14\ H_2O + Ca(HCO_3)_2 \rightarrow Al(OH)_3 + Ca\ SO_4 + H_2O + CO_2$
   d. $HClO \rightarrow HClO_3 + HCl$
   e. $H_2C_2O_4 + KMnO_4 + H_2SO_4 \rightarrow CO_2 + MnSO_4 + K_2SO_4 + H_2O$

4. Chlorination is the major disinfection method of tap water, please use figure and reactive equation to interpret what are (1) Breakpoint Chlorination ? (2) Free and Combined Chlorine Residuals ? (10%) In addition, please present two analytical methods to measure the Free and Combined Chlorine Residuals in water samples. (10%)

5. The incineration becomes a principal method for treatment of municipal solid waste in Taiwan. Please use reactive equation to describe the formation mechanisms of dioxins during the combustion of municipal solid waste. (20%)