編號: 317

國立成功大學 105 學年度碩士班招生考試試題

系 所:環境醫學研究所

考試科目:環境化學

考試日期:0228,節次:3

第1頁,共1頁

※ 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. Balance the following equations: (20%, 5% for each)
 - (1) $Ca(H_2PO_4)_2 + NaHCO_3 \rightarrow CaHPO_4 + Na_2HPO_4 + H_2O + CO_2$
 - (2) $FeSO_4 + K_2Cr_2O_7 + H_2SO_4 \rightarrow Fe_2(SO_4)_3 + Cr_2(SO_4)_3 + K_2SO_4 + H_2O_4$
 - (3) $Al_2(SO_4)_3 \cdot 14 \cdot H_2O + Ca(HCO_3)_2 \rightarrow Al(OH)_3 + CaSO_4 + H_2O + CO_2$
 - (4) $H_2C_2O_4 + KMnO_4 + H_2SO_4 \rightarrow CO_2 + MnSO_4 + K_2SO_4 + H_2O$
- 2. Please explain the following terms (4% for each, 20%)
 - (a) Avogadro constant;
 - (b) common ion effect;
 - (c) Ethalpy and Entropy;
 - (d)Buffers and Buffer Index
 - (e) Koc and Kow
- 3. Please use reactive formula to explain the photochemical mechanism that NOx and acetaldehyde convert to ozone? (10%)
- 4. Please define the acid rain? (6%) and explain how the sulfur dioxide and nitrogen oxides were main resources of acid rain. (6%) Then, try to explore the effects of acid rain to ecosystem. (8%)
- 5. Please explain the environmental meanings of measurement of nitrogen compounds in the tap water, wastewater, and natural waterbody (8%). Please define the analytical method of ammonia nitrogen, organic nitrogen, nitrite nitrogen, nitrate nitrogen respectively (12%).
- 6. Please use NH₃ as example and draw a figure to explain when NH₃ emitted to a lake, the variation of water concentration of NH₃ \ NO₂ \ NO₃ in the lake under aerobic environment (10%).