

國立高雄師範大學九十五學年度博士班招生考試試題

系所別：科學教育研究所

科 目：化學（全一頁）

1. Write the repeating unit of the condensation polymer obtained by combining $\text{HOOCCH}_2\text{CH}_2\text{COOH}$ and $\text{H}_2\text{NCH}_2\text{CH}_2\text{NH}_2$. (10%)
2. Free radicals are molecules or molecular fragments with unpaired electrons. Which of the following is a free radical – NO_2 ; CO_2 ; N_2O ? Explain your answer. (10%)
3. All proteins are condensation polymers of amino acids. Draw the structure of alanine (one of the amino acid with CH_3 hydrocarbon side chain). (10%)
4. The solubility product constant (K_{sp}) of CoCO_3 at 25°C is 1.0×10^{-10} . What is the solubility of CoCO_3 ? (10%)
5. The acid dissociation constant of a weak acid (HA) is 1.0×10^{-5} . A 25.0 mL of 0.20 M HA solution is titrated by 0.20 M of NaOH solution. What is the pH at the equivalence point? (10%)
6. Explain the following terms: (50%)
 - a. ferromagnetism
 - b. fission
 - c. electron affinity
 - d. disproportionation
 - e. chelate
 - f. aquo complex
 - g. molecularity
 - h. meridional isomer
 - i. three-center bond
 - j. tyndall effect