

General Chemistry

- Write a structural formula for each of the following compounds. (10%)
 - Ethylene glycol,
 - Acetonitrile,
 - Glycerin,
 - Phosphoric acid,
 - Formalin
- Name the following compounds with English and Chinese. (10%)
 - KClO_4 ,
 - NaBH_4 ,
 - $\text{K}_4[\text{Fe}(\text{CN})_6]$,
 - KCrO_4 ,
 - HF
- Which of the following alkenes can exist as cis-trans isomers? Write their structures. (10%)
 - $\text{CH}_2=\text{CHCH}_2\text{CH}_3$
 - $\text{CH}_2=\text{C}(\text{CH}_3)_2$
 - $\text{CH}_3\text{CH}=\text{CHCH}_3$
 - $\text{CH}_3\text{CH}=\text{CHC}_6\text{H}_5$
 - $\text{CH}_3\text{CH}_2\text{CH}=\text{CHBr}$
- Using the symbol R, write a general formula for (a) a primary amine, (b) a secondary amine, (c) a tertiary amine, and (d) an alkylaminium ion. (10%)
- Describe how the primary, secondary, tertiary and quaternary structures of a protein differ. (15%)
- Describe the alternative definitions of acids and bases on the basis of Arrhenius, Bronsted-Lowry and Lewis concepts, respectively. (15%)
- Please define what is (1) buffer solution, (2) buffer capacity, (3) acid-base indicator respectively. (15%)
- Please give an example to describe what is (1) adenine, (2) nucleotide, (3) nucleoside, respectively. (15%)