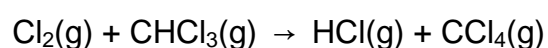


國立高雄師範大學九十六學年度博士班招生考試試題

系所別：科學教育研究所

科 目：化學（全一頁）

1. The rate law for the reaction

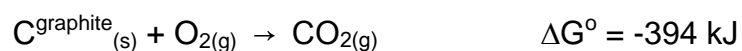
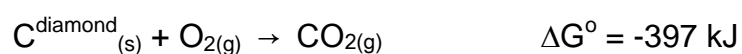


Is

$$\text{Rate} = k[\text{Cl}_2]^{1/2}[\text{CHCl}_3]$$

What are the units for k assuming time in seconds? (10%)

2. Using the following data (at 25°C),



Calculate ΔG° for the reaction $\text{C}^{\text{diamond}}_{(\text{s})} \rightarrow \text{C}^{\text{graphite}}_{(\text{s})}$ (15%)

3. Calculate the K_{sp} value for bismuth sulfide (Bi_2S_3), which has a solubility of 1.0×10^{-15} mol/L at 25°C. (15%)

4. A buffer solution contain 0.50 M acetic acid ($\text{HC}_2\text{H}_3\text{O}_2$, $K_a = 1.8 \times 10^{-5}$) and 0.50 M sodium acetate ($\text{NaC}_2\text{H}_3\text{O}_2$), calculate the pH of this solution. (10%)

5. Use molecular orbital theory to explain the octet rule. (10%)

6. Give the resonance structures of SO_3^{2-} . (10%)

7. How to distinguish the associative and dissociative reactions? (10%)

8. Give the mechanism of chloride atom reacting with ozone. (20%)