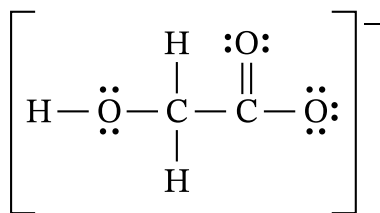
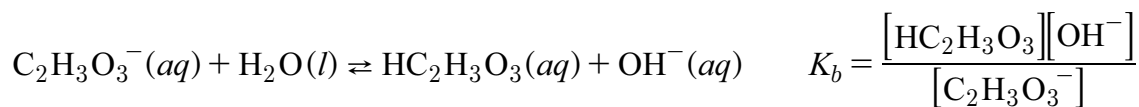


7. Answer the following questions about the glycolate ion, $\text{C}_2\text{H}_3\text{O}_3^-$, which acts as a base in aqueous solution. A Lewis diagram for the ion is provided.



A. On the Lewis diagram in part A, circle the atom that accepts the proton when the glycolate ion reacts with water.

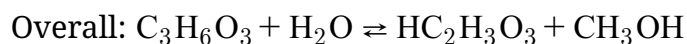
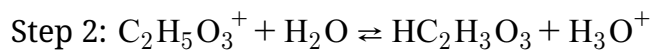
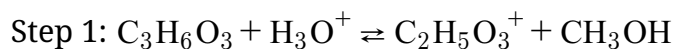
When the glycolate ion reacts with water, it forms glycolic acid, $\text{HC}_2\text{H}_3\text{O}_3$, according to the following equation. The K_b expression for the reaction is provided.



B. At 25°C , a 2.5 M solution of glycolate is found to have $[\text{OH}^-] = 1.3 \times 10^{-5}\text{ M}$.

- Calculate the value of K_b for the glycolate ion.
- Using your answer to part B (i), calculate the value of K_a for glycolic acid at 25°C .

Glycolic acid can be produced from the hydrolysis of methyl glycolate, $\text{C}_3\text{H}_6\text{O}_3$. A proposed mechanism for the reaction is given.



C. A student claims that H_3O^+ is a catalyst for the reaction. Do you agree or disagree? Justify your answer based on the mechanism given.

STOP

END OF EXAM