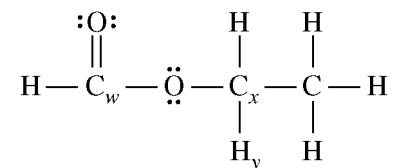


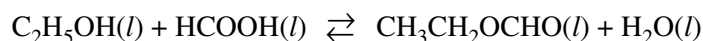
2011 AP[®] CHEMISTRY FREE-RESPONSE QUESTIONS (Form B)

6. Use principles of molecular structure, intermolecular forces, and kinetic molecular theory to answer the following questions.

(a) A complete Lewis electron-dot diagram of a molecule of ethyl methanoate is given below.



- (i) Identify the hybridization of the valence electrons of the carbon atom labeled C_w .
- (ii) Estimate the numerical value of the $\text{H}_y - \text{C}_x - \text{O}$ bond angle in an ethyl methanoate molecule. Explain the basis of your estimate.
- (b) Ethyl methanoate, $\text{CH}_3\text{CH}_2\text{OCHO}$, is synthesized in the laboratory from ethanol, $\text{C}_2\text{H}_5\text{OH}$, and methanoic acid, HCOOH , as represented by the following equation.



- (i) In the box below, draw the complete Lewis electron-dot diagram of a methanoic acid molecule.



Methanoic Acid