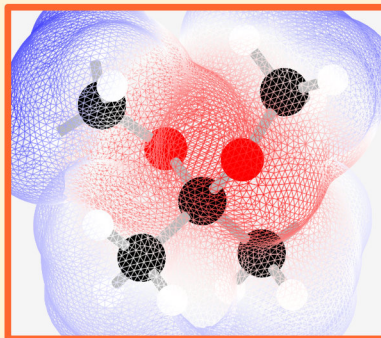


HIGHLIGHTS

- Acetal formation.
- Reversibility & driving the reaction to completion.
- Imine formation.
- Enamine formation.
- Examples.



Nucleophilic attack on the carbonyl group can occur with loss of the original carbonyl oxygen in a **condensation reaction**. The key step is the formation of a **good leaving group** by protonating the hydroxyl group of the tetrahedral intermediate. The reaction is reversible, and water must be removed to drive it forward. **Hydrolysis**, the addition of water to the compound, transforms the products back into the original C=O bond.

When the nucleophile is an **alcohol**, the reaction gives a hemiacetal then an **acetal**. If the nucleophile is a **primary amine** the product is an **imine**, the nitrogen equivalent of the carbonyl. If it is a **secondary amine**, then the product will be an **enamine**.

Mechanisms involving a leaving group on a tetrahedral intermediate are important. It is key to these condensation reactions and will be important in the next reaction of the carbonyl group, substitution reactions of carboxylic acids and their derivatives.

CHEMISTRY CLASSICS

ADDITION TO THE CARBONYL GROUP

CONDENSATION REACTIONS - ACETALS, IMINES, & ENAMINES



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