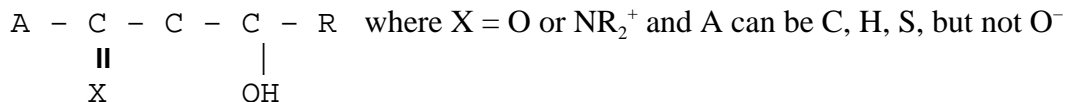


ELECTRON SINKS

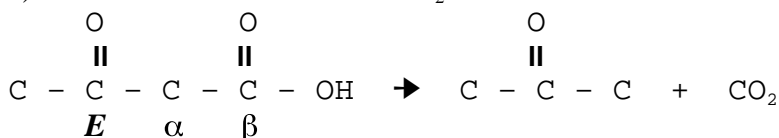
by Frank Deis

Electron sinks can promote breakage of a bond *alpha-beta* to the carbon of the electron sink, or can make the reverse reaction (condensation) possible. Many biochemical compounds with electron sinks have this general structure:

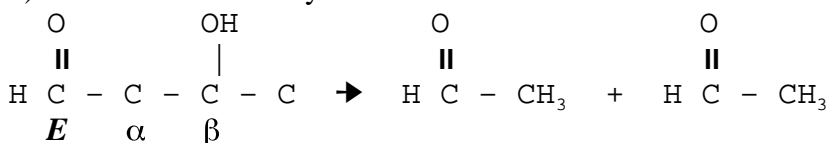


- Aldehydes and ketones provide good carbonyls for electron sinks. Thioesters (Acetyl CoA for example) also work. These are classic Aldol Cleavage rxns:

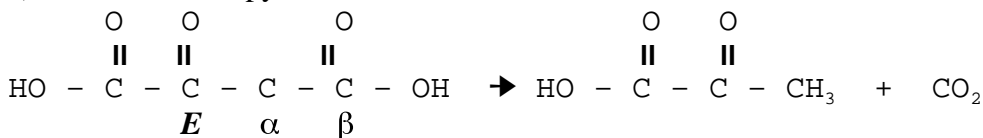
a) Acetoacetate \rightarrow acetone + CO₂



b) Aldol \rightarrow 2 acetaldehyde

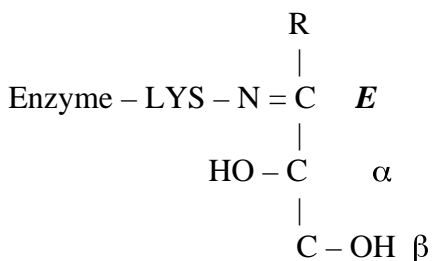


c) oxaloacetate \rightarrow pyruvate + CO₂



- Protonated SCHIFF BASE of carbonyl is even better:

ALDOLASE and TRANS-ALDOLASE use the side chain of Lysine (NH) to react with carbonyls and form their Schiff Base:



- THIAMINE PYROPHOSPHATE is an excellent electron sink provider, used as a cofactor by the Pyruvate DH Complex, -Ketoglutarate DH Complex, and Transketolase. When an electron sink is in the "right" place, a Schiff Base can enhance its activity. When it is in the "wrong" place TPP can "move it over" one carbon.