An active methylene compound is a compound that has the following general structural formula.

\[ \begin{array}{c}
  H \\
  \backslash \\
  \boxed{\text{E}^1} \\
  H \\
  \backslash \\
  \boxed{\text{E}^2} \\
\end{array} \]

\( \text{E}^1, \text{E}^2 = \text{a functional group that withdraws electrons by resonance} \)  

eg:

\[ \begin{array}{ll}
  \text{H} & \text{H} \\
  \text{O} & \text{O} \\
  \text{H} & \text{H} \\
  \text{H} & \text{H} \\
\end{array} \quad \begin{array}{ll}
  \text{H} & \text{H} \\
  \text{O} & \text{O} \\
  \text{H} & \text{H} \\
  \text{H} & \text{H} \\
\end{array} \]

The conjugate base of an active methylene compound is highly resonance stabilized.

eg:
Consequently, active methylene compounds are highly acidic and can be deprotonated, for all practical purposes, irreversibly, using common strong bases, such as the hydroxide ion or alkoxide ions.

\[
\begin{align*}
\text{compound} & \quad \text{pK}_a \\
\text{1} & \quad 9 \\
\text{water} & \quad 16
\end{align*}
\]

The equilibrium constant, \( K \), can be calculated as:

\[
K = \frac{10^{\text{pK}_a(1)}}{10^{\text{pK}_a(\text{OH})}} = \frac{10^9}{10^6} = 10^3
\]

Notice that the equilibrium constant, \( K \), is very large.

Contributors
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