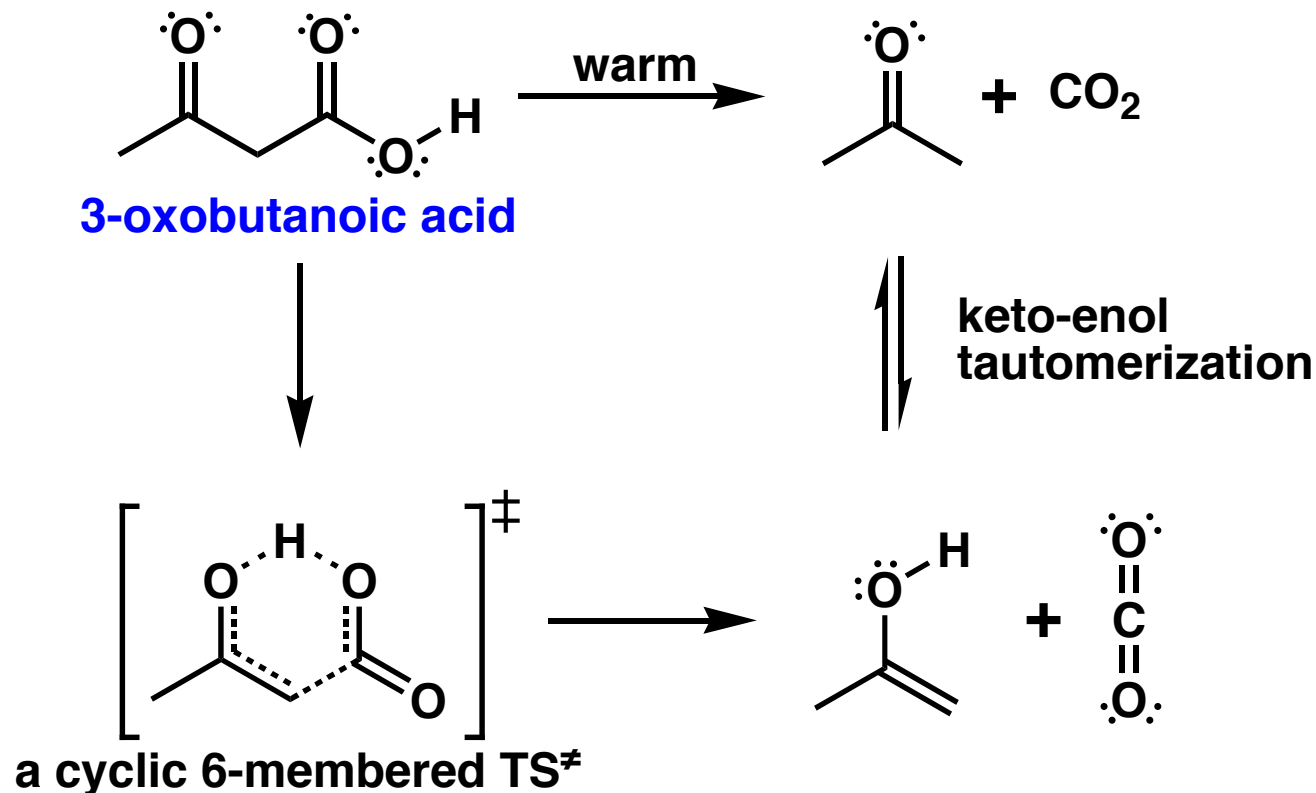


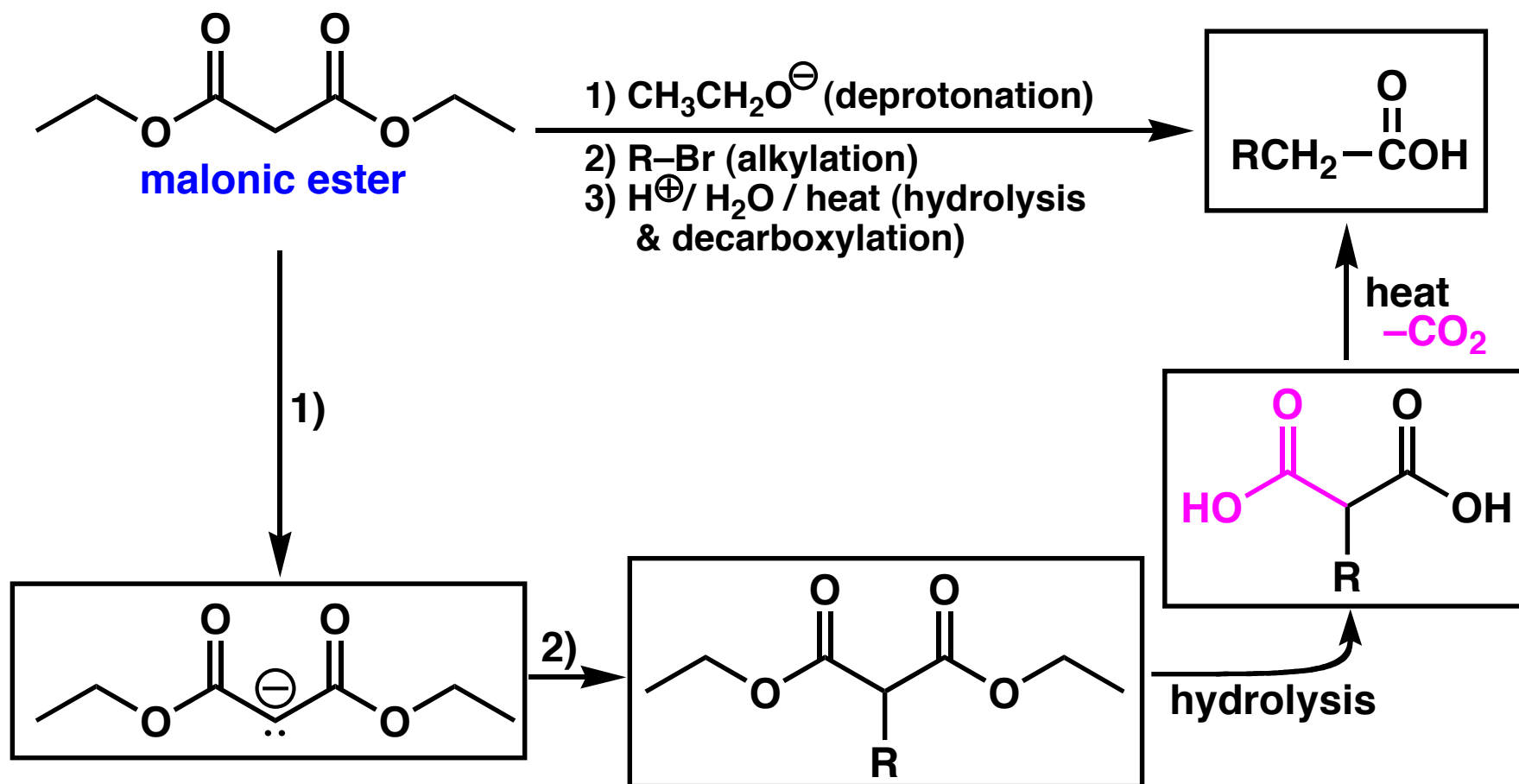
# $\beta$ -Ketoacids are Easily Decarboxylated

**Decarboxylation** is the loss of  $\text{CO}_2$  from the carboxyl group of an acid. Most carboxylic acids are quite resistant to moderate heat. Exceptions are carboxylic acids that have a carbonyl group  $\beta$  to the carboxyl. These carboxylic acids are derived from Claisen condensations (following ester hydrolysis).



# Alkylation of $\beta$ -Dicarboxylic Esters (Malonic Ester Synthesis)

Other synthetic plans take advantage of the ease at which decarboxylation occurs when a carbonyl group is in the  $\beta$  position relative to the carboxylic acid. Here is a general synthetic route to carboxylic acids.



# Alkylation of $\beta$ -Ketoesters (Acetoacetic Ester Synthesis)

Here is a general synthetic route to methyl ketones.

