RECALL: An acid can be deprotonated by a base that has a conjugate acid with a higher $pK_a$. 

NaOH and NaHCO$_3$ will react with carboxylic acids:

\[
\begin{align*}
\text{H}_3\text{C} & \text{O} \text{H} + \text{Na}^+\text{OH}^- \rightarrow \text{H}_3\text{C} \text{O} \text{Na}^+ + \text{H}_2\text{O} \\
pK_a \sim 5 & & \text{pK}_a 15.7
\end{align*}
\]

\[
\begin{align*}
\text{CH}_2\text{O} \text{H} + \text{Na}^+\text{HCO}_3^- \rightarrow \text{CH}_2\text{O} \text{Na}^+ + \text{H}_2\text{CO}_3(aq) \\
pK_a \sim 5 & & \text{pK}_a 6.4
\end{align*}
\]

Carboxylic acids and NaHCO$_3$ will effervesce due to:

\[
\text{H}_2\text{CO}_3(aq) \leftrightarrow \text{H}_2\text{O(l)} + \text{CO}_2(g)
\]

(Alcohols, phenols and thiols are not deprotonated by NaHCO$_3$).

Recall (lecture 9): Thiols and phenols are deprotonated by NaOH. Alcohols do not react with NaOH.