Two mechanisms have been proposed for nucleophilic aromatic substitution, one of which involves a benzyne as the intermediate and, therefore, is called benzyne mechanism.

eg:

\[
\begin{align*}
\text{Step 1:} & \quad \begin{array}{c}
\text{CH}_3 \quad \text{Cl} \\
\text{benzyne} \quad \text{intermediate}
\end{array} \quad \xrightarrow{\text{NaNH}_2} \\
\text{solvent} \quad \text{NH}_3 (g) \quad \text{NH}_3 \quad \text{benzyne}
\end{align*}
\]

\[
\begin{align*}
\text{Step 2:} & \quad \begin{array}{c}
\text{CH}_3 \\
\text{AM}
\end{array} \quad \xrightarrow{\text{NH}_3} \\
\text{benzyne} \quad \text{NH}_3
\end{align*}
\]

\[
\begin{align*}
\text{Step 3:} & \quad \begin{array}{c}
\text{CH}_3 \\
\text{AM}
\end{array} \quad \xrightarrow{\text{NH}_3} \\
\text{benzyne} \quad \text{NH}_3
\end{align*}
\]
Step 1 requires a very strong base. Thus, for the benzyne mechanism to be operant, the medium must be very strongly basic.

see also SNAr mechanism

Contributors

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