A mixture of mesityl oxide and phorone is obtained from acetone in the presence of dry HCl gas.

Reactions Different in Aldehydes and Ketones

**[A]** Reactions of only Aldehydes:

**[1]** Reducing Properties:

Aldehyde readily undergo oxidation. Therefore, they behave as strong reducing agents.

**[i]** With Schiff's Reagent: Colourless solution obtained on passing SO\(_2\) gas in deepred-coloured aqueous solution of magenta dye (also called fuchsin and rosiniline hydrochloride) is known as Schiff's reagent. All aldehydes restore the pink colour of dilute Schiff's reagent in cold. Therefore, it is a specific test of aldehydes, which is called **Schiff's test**.

\[
\begin{align*}
\text{Cold dilute Schiff's reagent} & \quad \text{Aldehyde} \quad \text{Pink Colour} \\
(\text{Colourless oxidised form}) & \quad (\text{Coloured reduced form})
\end{align*}
\]

**[ii]** With Tollens Reagent: Ammoniacal silver nitrate (AgNO\(_3\) + NH\(_4\)OH) is called **Tollens' reagent**. Silver mirror is formed on carefully heating an aldehyde with Tollens' reagent in a test tube on a water-bath. Greyish-black precipitate of silver is formed on heating directly and rapidly.

\[
\begin{align*}
\text{Ag}^{+1} + 2\text{NH}_4\text{OH} & \quad \rightarrow \quad \text{Ag}^{+1} (\text{NH}_3)_{2} + 2\text{H}_2\text{O} \\
2\text{Ag}^{+1} (\text{NH}_3)_{2} + \text{H}_2\text{O} & \quad \rightarrow \quad \text{Ag}_2\text{O} + 2\text{NH}_4^{+1} + 2\text{NH}_3 \\
\text{RCHO} + \text{Ag}_2\text{O} & \quad \rightarrow \quad \text{RCOOH} + 2\text{Ag}
\end{align*}
\]

For convenience silver mirror test can be written as follows.

\[
\begin{align*}
\text{AgNO}_3 + \text{NH}_4\text{OH} & \quad \rightarrow \quad \text{AgOH} + \text{NH}_4\text{NO}_3 \\
2\text{AgOH} & \quad \rightarrow \quad \text{Ag}_2\text{O} + \text{H}_2\text{O} \\
\text{RCHO} + \text{Ag}_2\text{O} & \quad \rightarrow \quad \text{RCOOH} + 2\text{Ag}
\end{align*}
\]

**[iii]** With Fehling's Reagent: In laboratory. Fehling's solution is kept in two bottles, labeled as Fehling's 'Solution A' and Fehling's solution 'B'.

Fehling solution 'A' - Aqueous solution of CuSO\(_4\) (Blue)
Fehling solution 'B' - Alkaline solution (NaOH or Na\(_2\)CO\(_3\)) of sodium potassium tartarate (Rochelle's salt) (Colourless)

On mixing Fehling's solutions 'A' and 'B' in equal amounts, the colour of solution becomes deep blue.

\[
\begin{align*}
\text{CuSO}_4 + 2\text{NaOH} & \quad \rightarrow \quad \text{Cu(OH)}_2 + \text{Na}_2\text{SO}_4
\end{align*}
\]