A catalytic hydrogenation, or catalytic reduction, is a reduction of an organic compound using molecular hydrogen as the reducing agent and a transition metal as the catalyst. Most catalytic hydrogenations are addition reactions.

**eg. 1:**

\[
\text{CH}_2=\text{CH}_2 + \text{H}_2 \xrightarrow{\text{catalyst: transition metal}} \text{CH}_3-\text{CH}_3
\]

**eg. 2:**

\[
\begin{array}{c}
\text{C} \\
\text{H}_3
\end{array} + \text{H}_2 \xrightarrow{\text{catalyst: transition metal}} \begin{array}{c}
\text{C} \\
\text{H}_3
\end{array}
\]

**eg. 3:**

\[
\text{CH}_3-\text{C}≡\text{C}-\text{CH}_3 + 2\text{H}_2 \xrightarrow{\text{catalyst: transition metal}} \text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_3
\]

**eg. 4:**

\[
\begin{array}{c}
\text{C} \\
\text{H}_3
\end{array} \quad \text{and} \quad \begin{array}{c}
\text{C} \\
\text{H}_3
\end{array} + \text{H}_2 \xrightarrow{\text{catalyst: transition metal}} \begin{array}{c}
\text{C} \\
\text{H}_3
\end{array}
\]

There are many transition metals used as catalysts in catalytic hydrogenation. The most common ones are Pt, Pd, and Ni.

see also heat of hydrogenation

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**Contributors**

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