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.

\[ \text{eg. 1:} \]
\[
\text{CH}_2\equiv\text{CH}_2 + \text{H}_2 \xrightarrow{\text{catalyst: transition metal}} \text{CH}_3\text{CH}_3
\]

\[ \text{eg. 2:} \]
\[
\text{CH}_2\text{CO} + \text{H}_2 \xrightarrow{\text{catalyst: transition metal}} \text{CH}_2\text{OH}
\]

\[ \text{eg. 3:} \]
\[
\text{CH}_3\text{C} \equiv \text{C} \equiv \text{CH}_3 + 2\text{H}_2 \xrightarrow{\text{catalyst: transition metal}} \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3
\]

\[ \text{eg. 4:} \]
\[
\text{CH}_3\text{CH}_2\text{C} = \text{N} \text{CH}_3 + \text{H}_2 \xrightarrow{\text{catalyst: transition metal}} \text{CH}_3\text{CH}_2\text{OH}\text{CH}_3\text{CH}_3
\]

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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