

② Heterogeneous catalyst :-

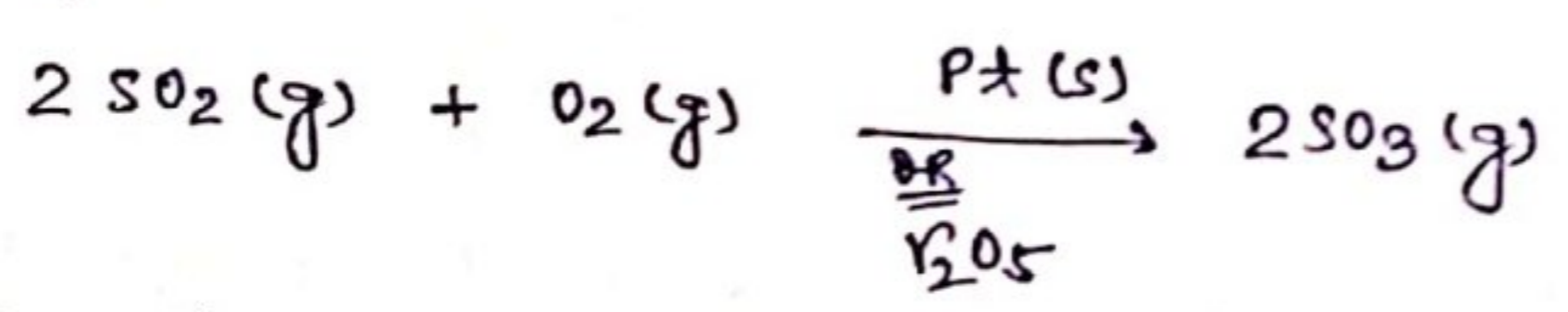
The catalyst in the different physical phase from the reactant is termed as heterogeneous catalyst and this process is called heterogeneous catalysis.

Such reaction in which the reactants are in the gas phase while the catalyst is a solid.

for examples -

① formation of Sulphur trioxide -

When sulphur dioxide is oxidised with oxygen in presence of finely divided platinum or V<sub>2</sub>O<sub>5</sub>.



Here, Pt or V<sub>2</sub>O<sub>5</sub> acts as catalyst.

② Combination of Nitrogen with Hydrogen :-

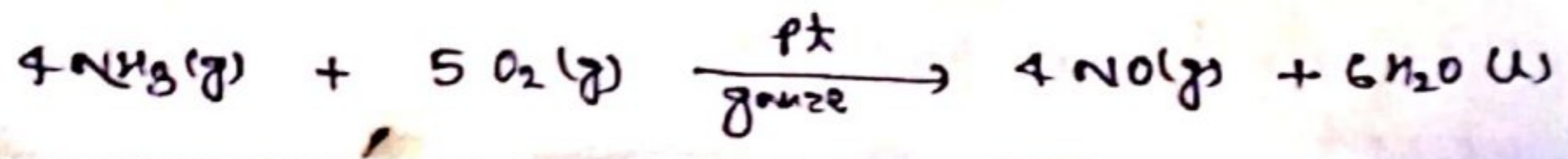
When nitrogen is combined with hydrogen to form ammonia in presence of finely divided Iron.



Here, Fe acts as catalyst.

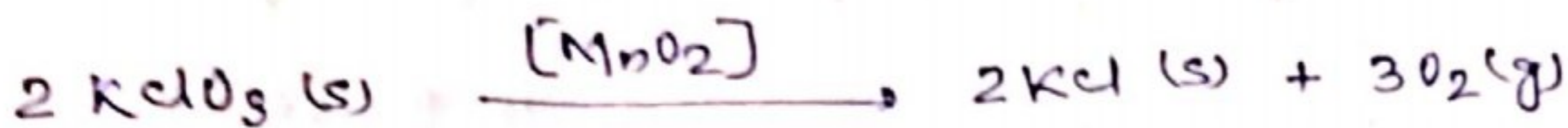
③ Oxidation of Ammonia :-

When ammonia is oxidised in presence of Pt gauze, nitric oxide is formed.



④ Decomposition of Potassium chlorate :-

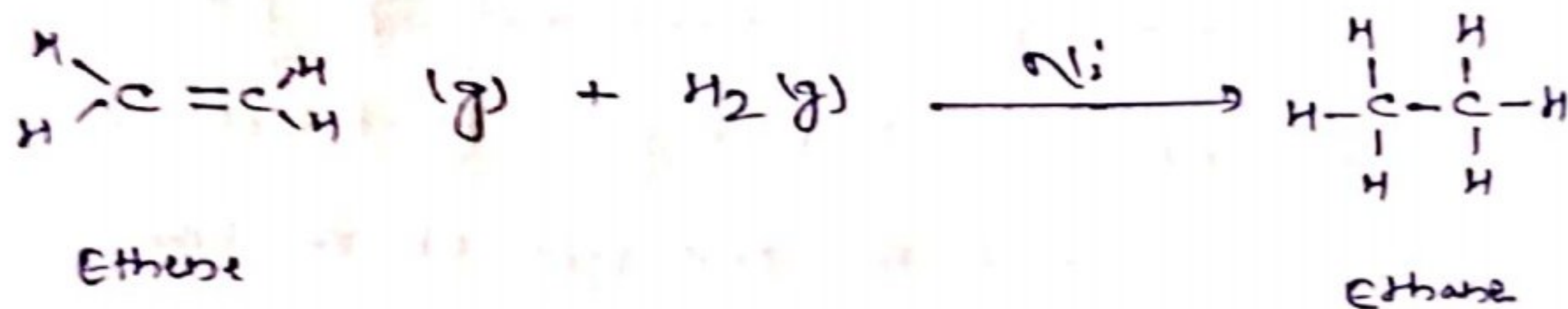
When potassium chlorate (KClO<sub>3</sub>) is decomposed in presence of catalyst MnO<sub>2</sub>.



Here, MnO<sub>2</sub> acts as catalyst.

⑤ Hydrogenation reaction :-

When an unsaturated Organic Compound are hydrogenated in presence of finely divided nickel.



Here, Ni acts as catalyst.

\* Specificity of catalysed Reaction :-

\* Characteristics of catalyst :-

(1). The mass and composition of a catalysts remains the same even after a reaction is completed.

(2). A catalyst doesn't initiate the chemical reaction.

(3). A small amount of catalyst is sufficient to catalysed the rate of a chemical reaction.

When the catalyst is finely divided in the state. It has more effective absorbing power -

due to its larger surface area and more active centres.

④ A catalyst doesn't affect the equilibrium position.

The Gibbs free energy changes for the reaction remains the same whether it takes place in the absence or presence of the catalyst in the reaction.

Since,

$$-\Delta G^\circ = RT \ln K$$

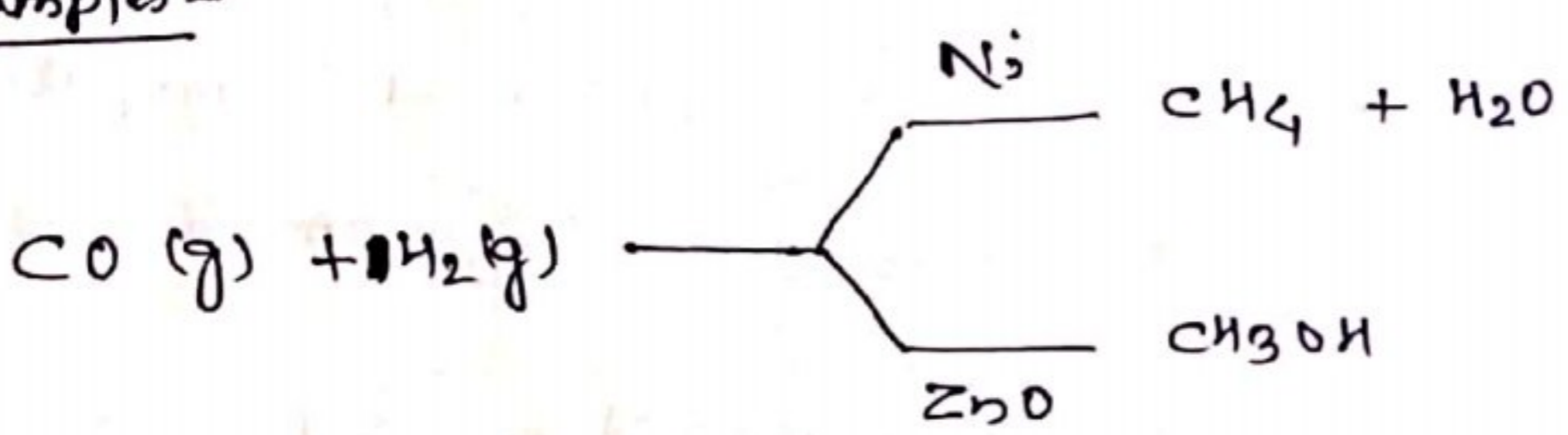
The catalyst ~~doesn't~~ increases both the rate constant for forward and backward reaction and equilibrium constant remains constant.

⑤. Action of catalyst is Universal and specific.

The nature of catalyst is highly specific, because a catalyst which is good for one type of ~~reaction~~ reactions may be ineffective in the other one.

Adsorption and subsequent conversion into products of the reacting molecules at the catalytic surface occurs by the chemical affinity of the reactant for the catalyst. This explains the specificity of catalyst.

for examples-



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