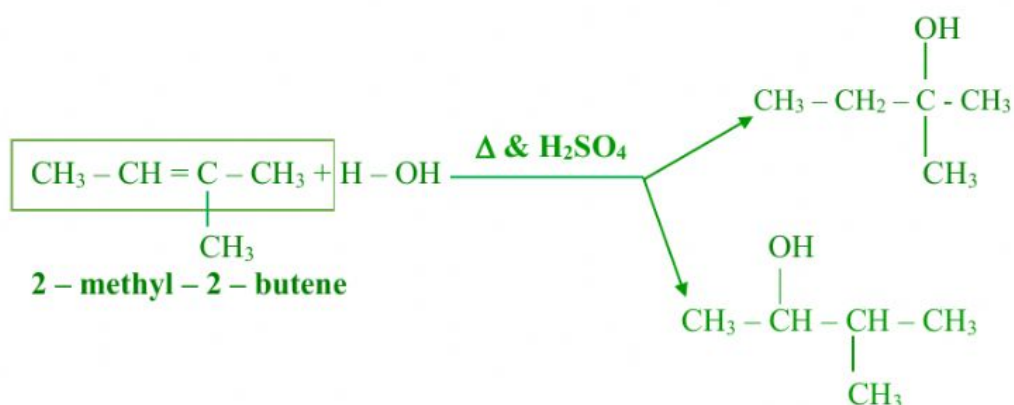
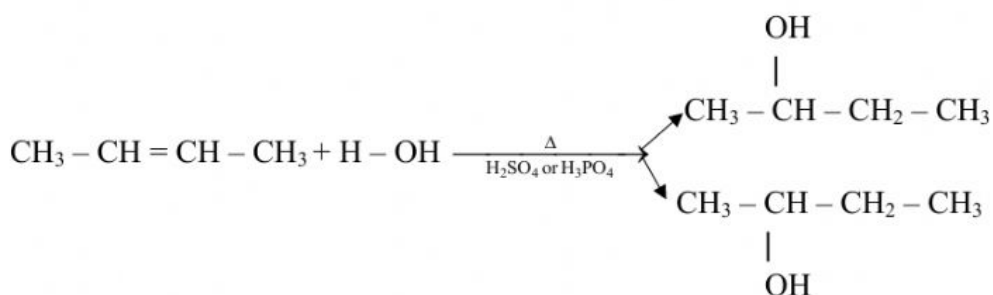
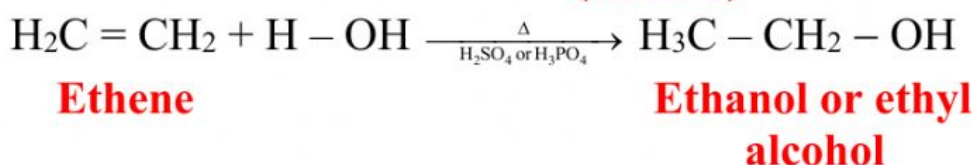
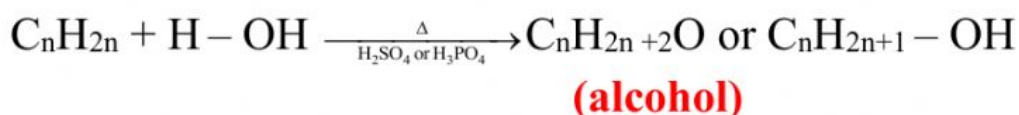


## D – Hydration of Alkenes (Addition of H<sub>2</sub>O: H – OH)

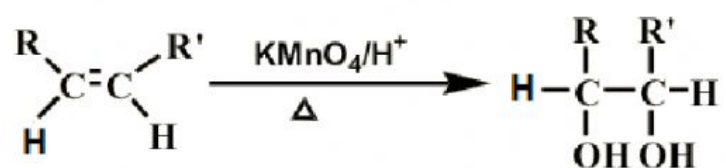
The hydration reactions of alkenes are catalyzed by the inorganic acids H<sub>2</sub>SO<sub>4</sub> and H<sub>3</sub>PO<sub>4</sub>. The hydration reaction of alkenes is very important; it is used in industry to manufacture alcohols.



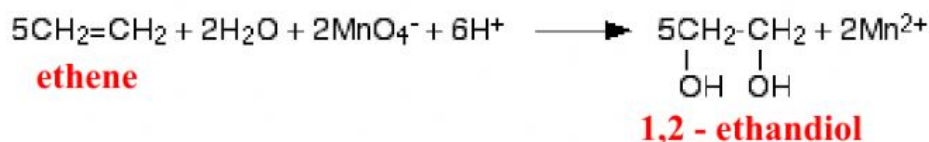
### 3 – Oxidation of alkenes with acidified potassium permanganate: $\text{KMnO}_4$

Alkenes react with acidified ( $\text{H}_2\text{SO}_4$ ) potassium permanganate solution (purple color) in the presence of heat, the purple solution becomes colorless due to the formation of  $\text{Mn}^{2+}$ .

The reaction is identified as oxidation – reduction reaction. Where the alkenes are oxidized into dialcohol, while the permanganate ( $\text{MnO}_4^-$ ) is reduced into  $\text{Mn}^{2+}$ .



#### Example:



### 4 – Ozonolysis of Alkenes

Ozonolysis is an organic reaction where the unsaturated bonds of alkenes compounds are cleaved with ozone. Alkenes form organic compounds in which the multiple carbon–carbon bond has been replaced by a **carbonyl group:  $-\text{C}=\text{O}$** . Then,

carbonyl compounds will be formed: aldehydes and ketones.

**Zinc or dimethyl sulfide is used to ensure a reactive medium (reducing agent), which enables the control of the nature of the products of the reaction.**

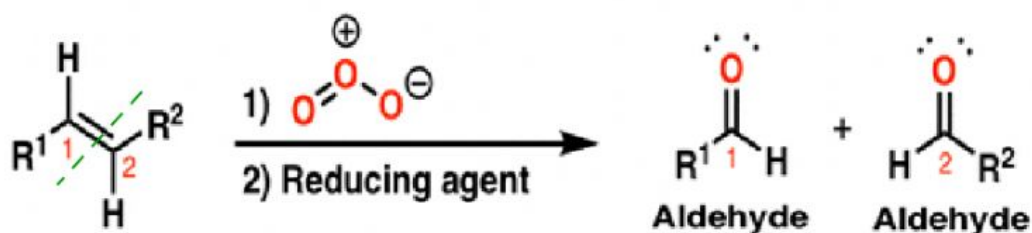
### Naming Aldehydes & Ketones

**The names for aldehyde and ketone compounds are derived using similar nomenclature rules as for alkanes, changing the terminal "e" with the suffixes -al and -one respectively.**

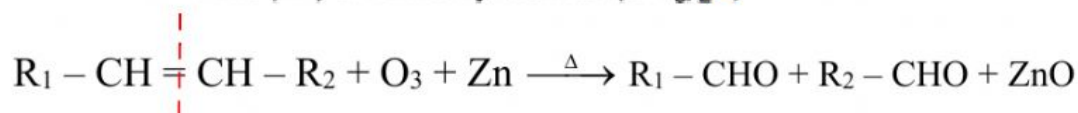
**Aldehyde: Alkane  $\longrightarrow$  Alkanal**

**Ketone: Alkane  $\longrightarrow$  Alkanone**

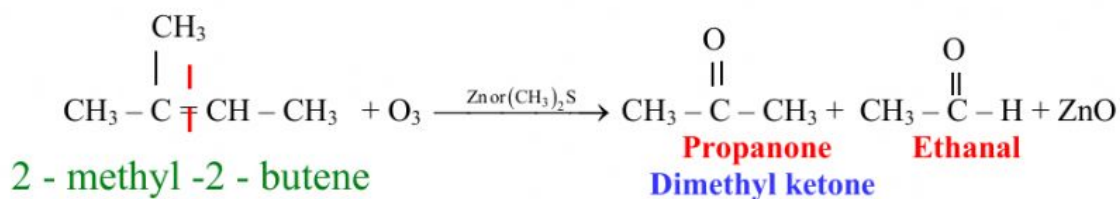
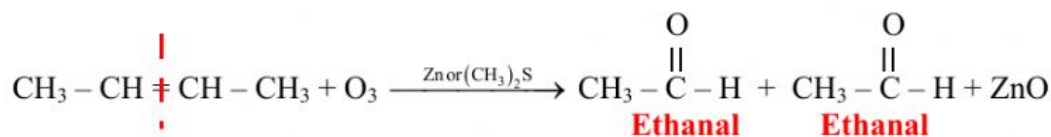
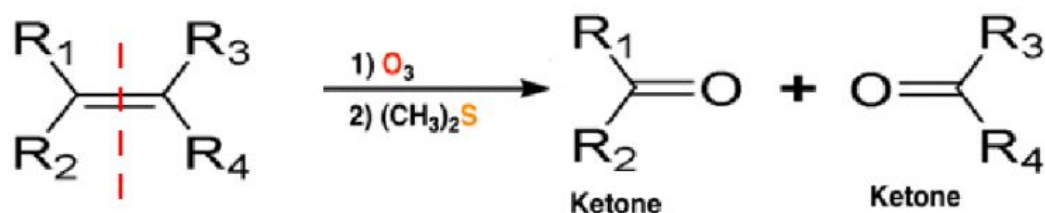
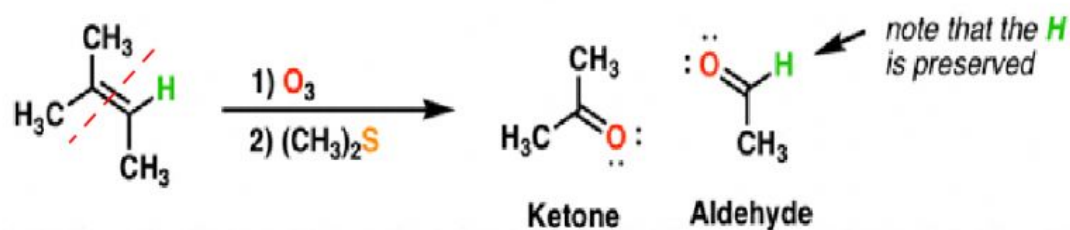
**Ozonolysis of alkenes with reductive workup**



*(common reducing agents are zinc (Zn) or dimethyl sulfide (CH<sub>3</sub>)<sub>2</sub>S)*



"Reductive workup" merely cleaves the C=C bond and replaces with oxygen



2 - methyl -2 - butene