

HALOALKANES & HALOARENES 1.

Lecture -15

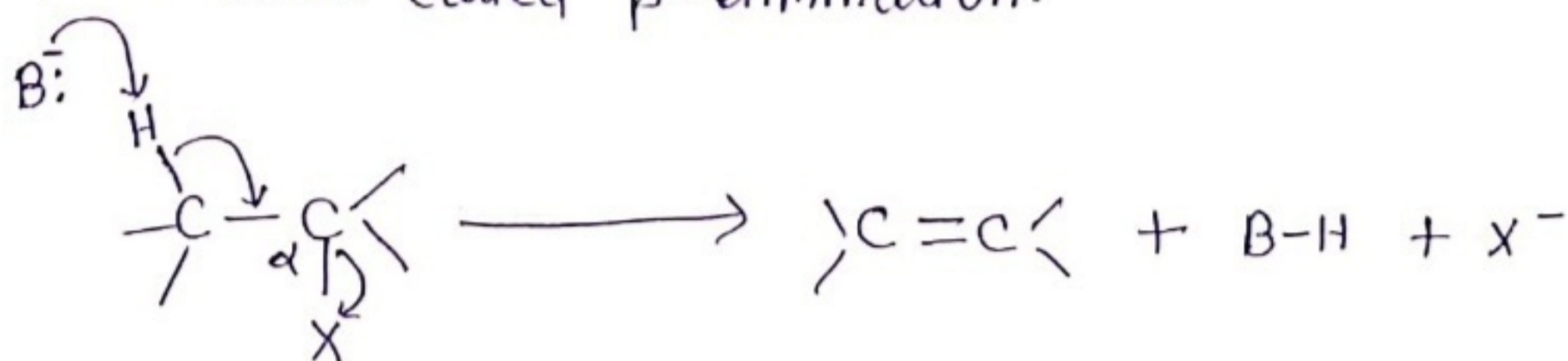
CHEMISTRY, CLASS-XII, UNIT-10, 11/07/2020

Topic - Elimination Reaction

When a haloalkane with β -hydrogen atom is heated with alcoholic solution of KOH, there is elimination of hydrogen atom from β -carbon and a halogen atom from the α -carbon atom.

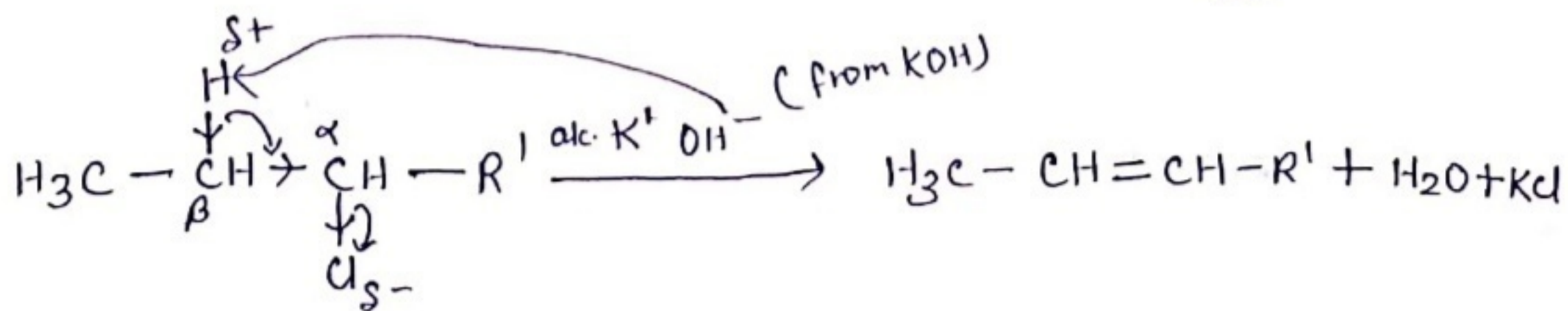
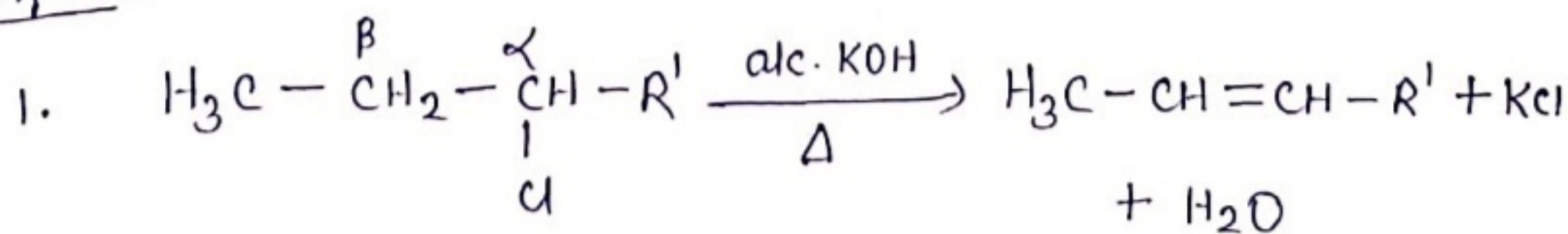
As a result, an alkene is formed as a product.

Since β -hydrogen atom is involved in elimination, it is often called β -elimination.



B = Base ; X = Leaving Group

example :

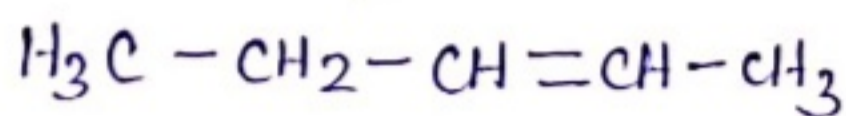
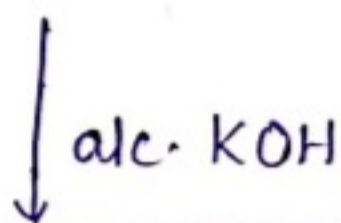
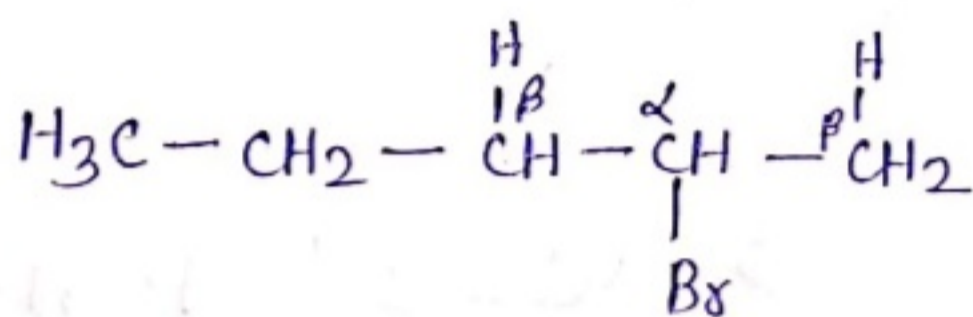


* If there is possibility of formation of more than one alkene due to the availability of more than one β -hydrogen atoms, usually one alkene is formed as the major product.

* Which alkene will be major product is decided by Saytzeff rule (Also pronounced as 'Zaitsev rule')

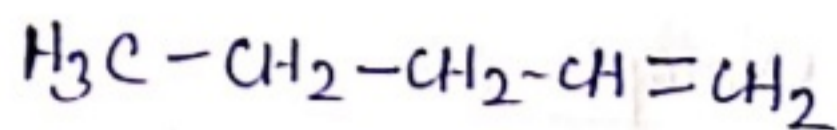
Statement of Saytzeff Rule

"In dehydrohalogenation reactions, the preferred product is that alkene which has the greater number of alkyl groups attached to the doubly bonded carbon atoms."



Pent-2-ene

(81%)

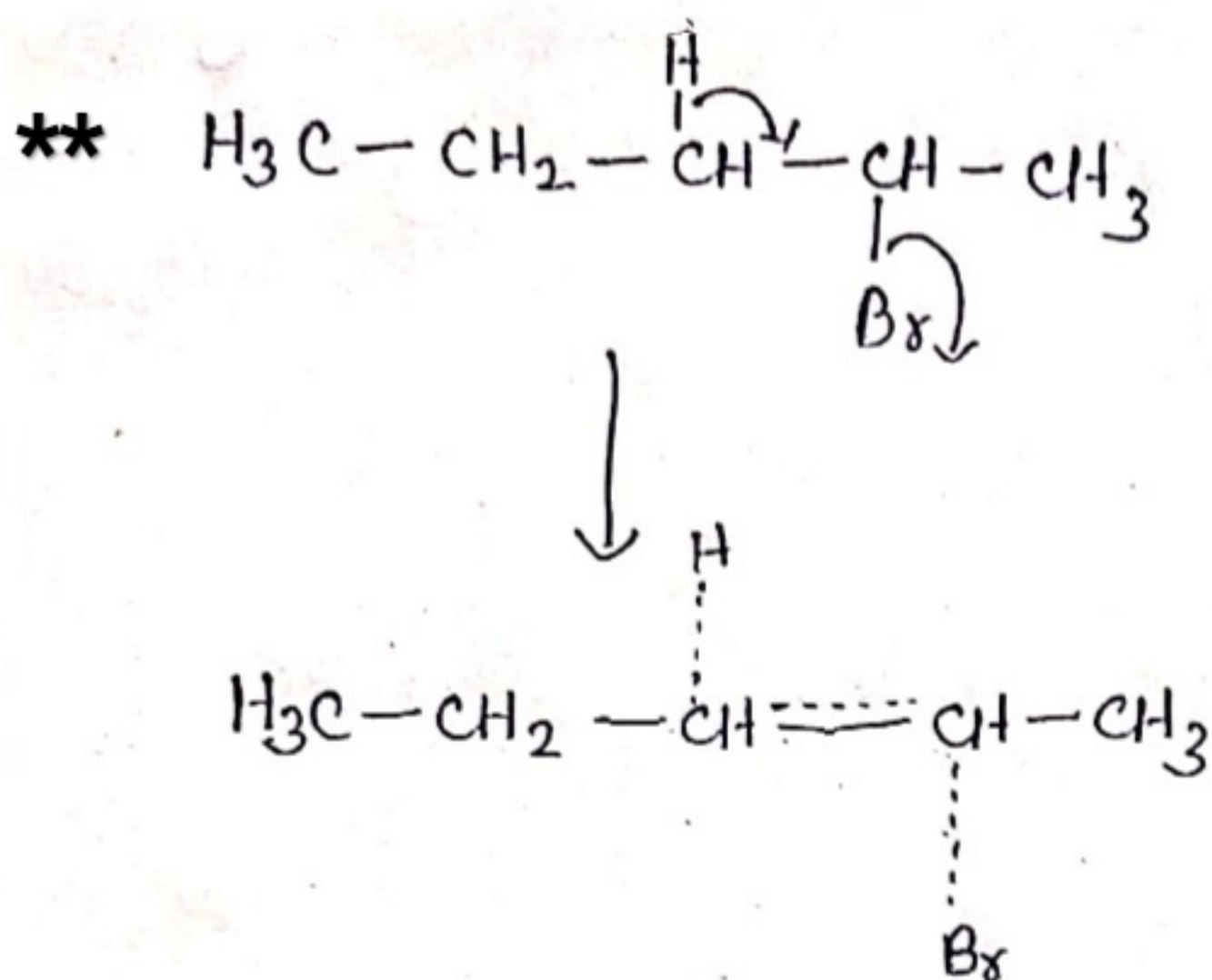


Pent-1-ene

(19%)

Mechanism

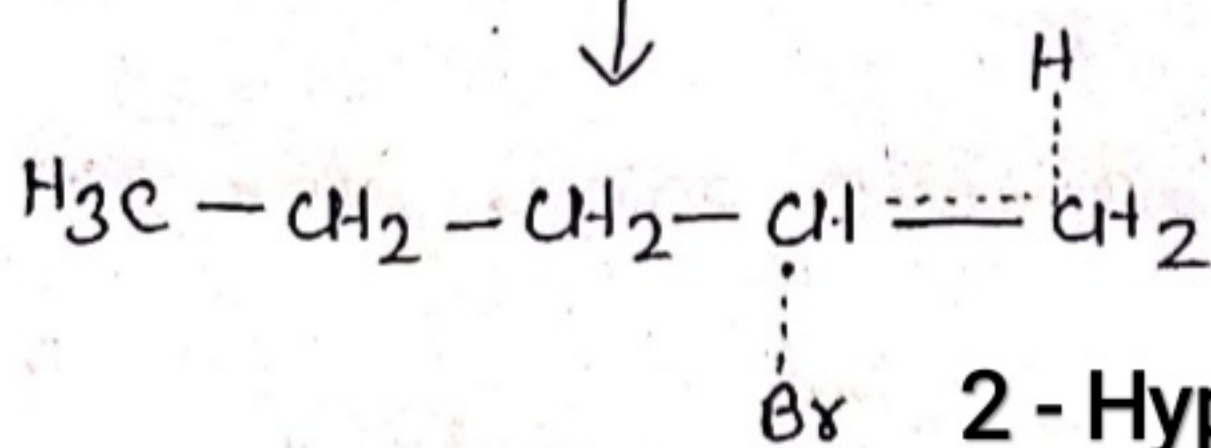
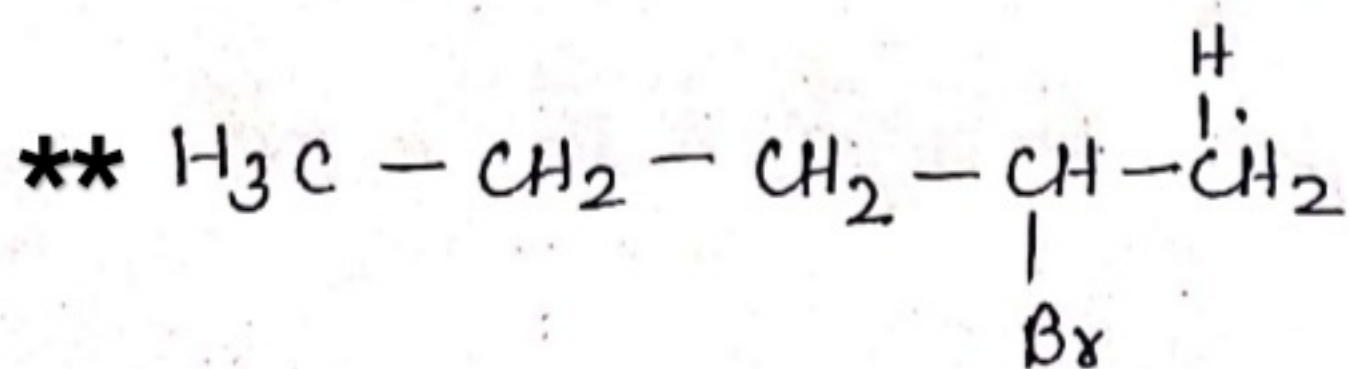
3.



T.S.1

5 - Hyperconjugated C-H bond

(More Stable T.S.)



2 - Hyperconjugated C-H bond
(Less Stable T.S.)

4.

Since, we know that more hyperconjugation in the T.S; is more stable. hence, T.S.1 form more easily hence, pent-2-ene

($\text{H}_3\text{C}-\text{CH}_2-\text{CH}=\text{CH}-\text{CH}_3$) will be major product.

* We can also use sodium ethoxide ($\text{C}_2\text{H}_5\text{ONa}$) as dehydrohalogenating agent.

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