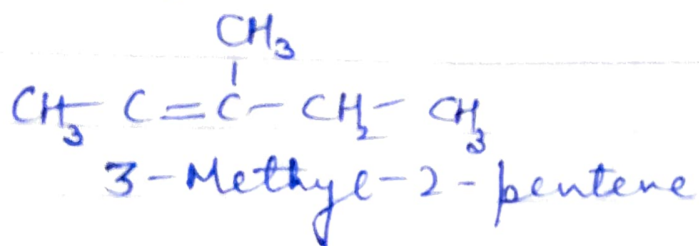


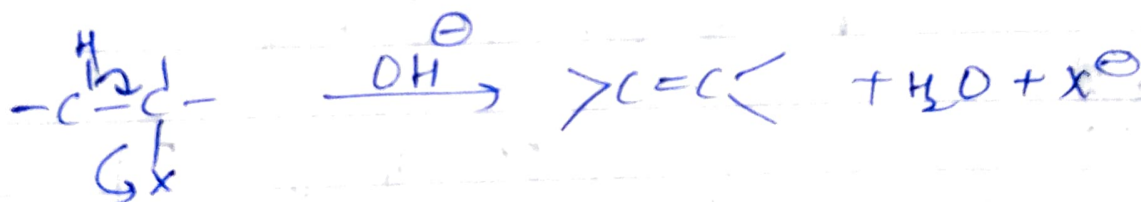
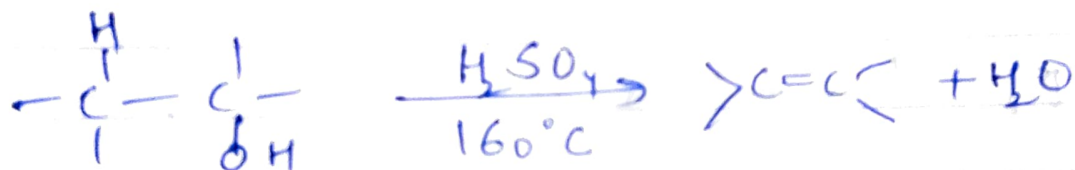
Alkenes / Olefins
 $(C=C)$ $C_n H_{2n}$
 sp^2 , 1 π bond

C_2H_4 Ethane
 C_3H_6 Propane
 C_4H_8 Butene



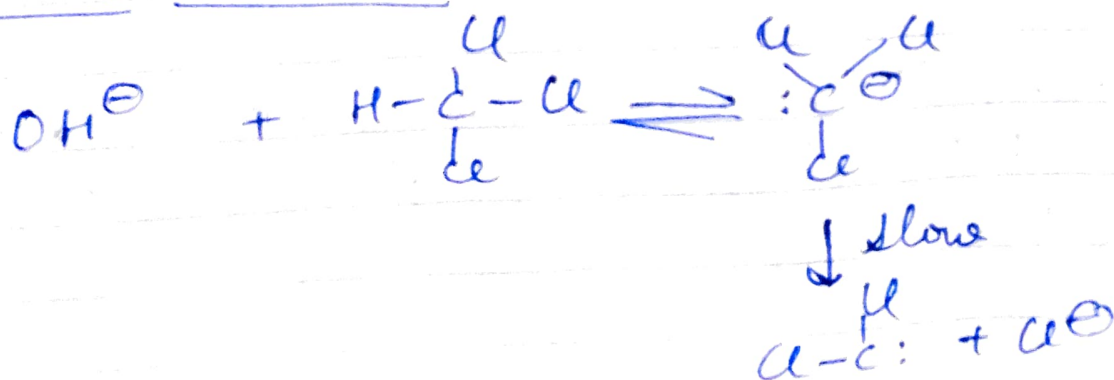
Methods of preparation:-

1) From elimination reaction:-



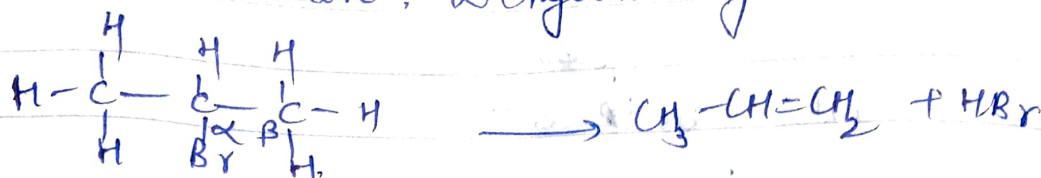
Two types:-
 1) α elimination ($1,1$ -elimination)
 2) β elimination ($1,2$ -elimination)

α -elimination:-



Both eliminating gfs are on same carbon.
Unstable intermediate, carbene form.

ii) β -elimination ^(1,2) :- Dehydrohalogenation



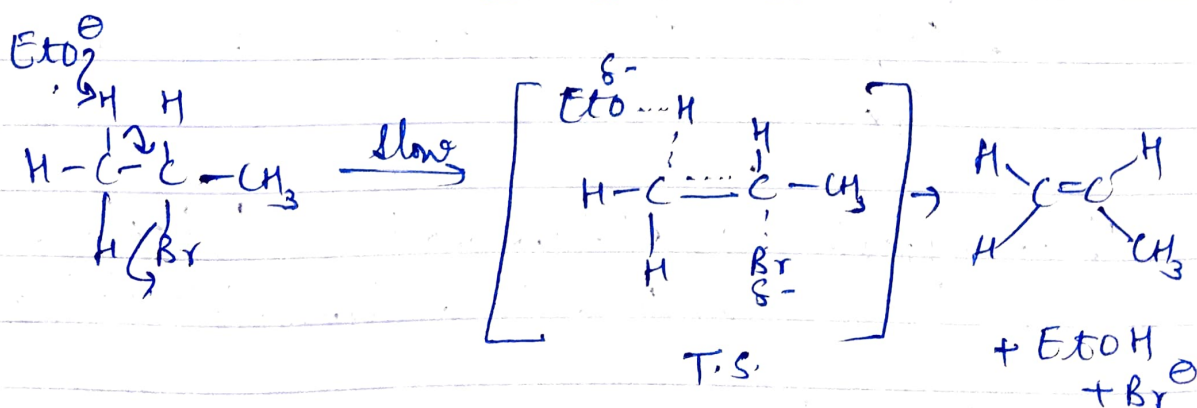
Mechanism of β -elimination:-

i) S_N^2 like E_2

ii) S_N^1 like E_1

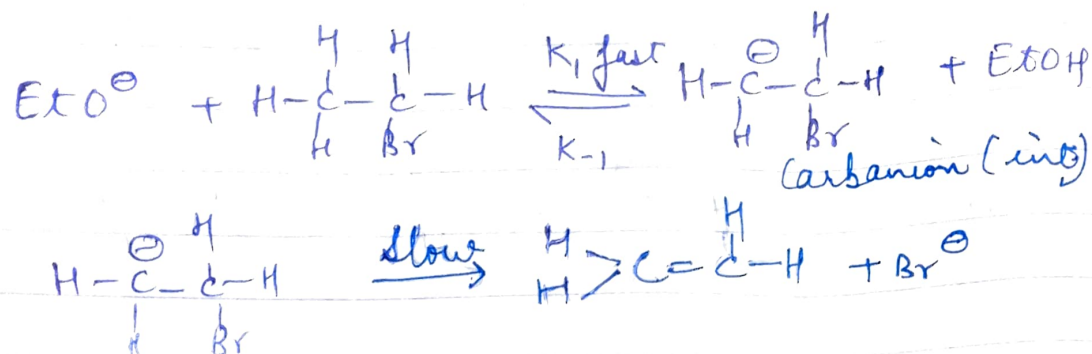
i) E_2 elimination:-

$$r \propto [\text{RX}] [\text{OH}^-]$$



In E_2 rxns, trans elimination takes place b'coz both eliminating gfs are trans to each other.

$E1cB \rightarrow$ occurs in two steps.
occurs generally when eliminating proton is acidic.

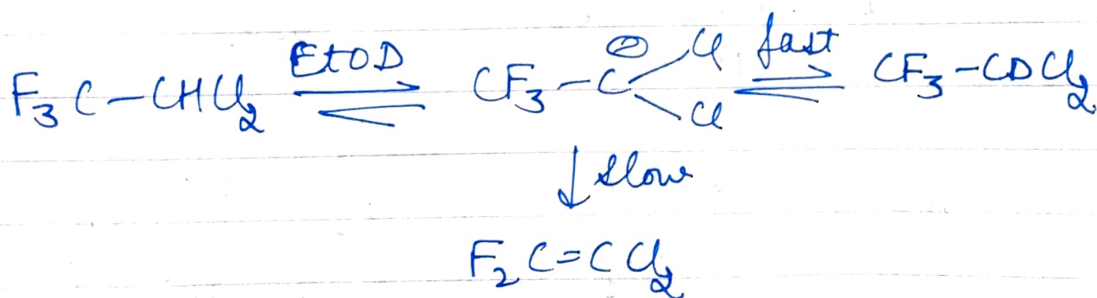


also known as carbanion mechanism.

Second step is slow. Order of $E1cB = 2$.

$\rightarrow$ The intermediate is conjugate base of reactant.
 $\therefore$ c/a $E1cB$.

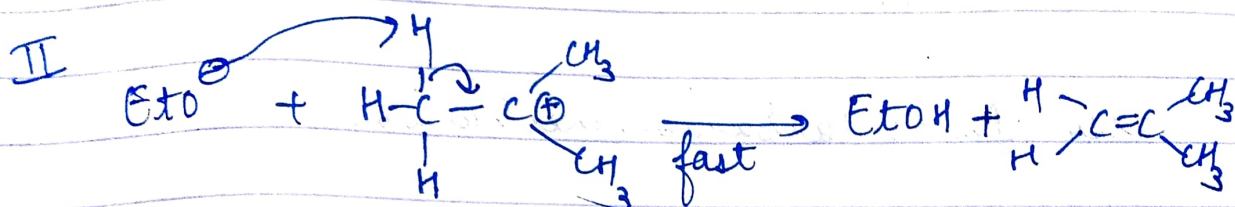
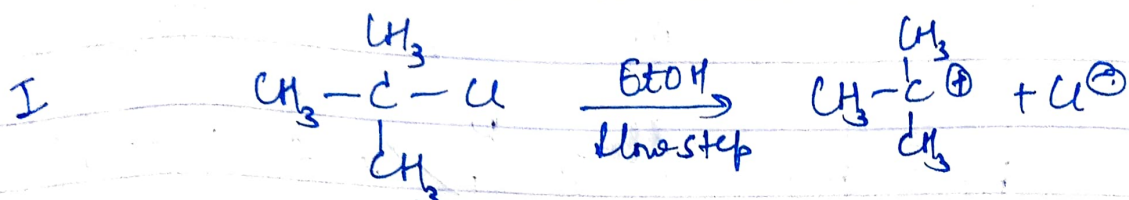
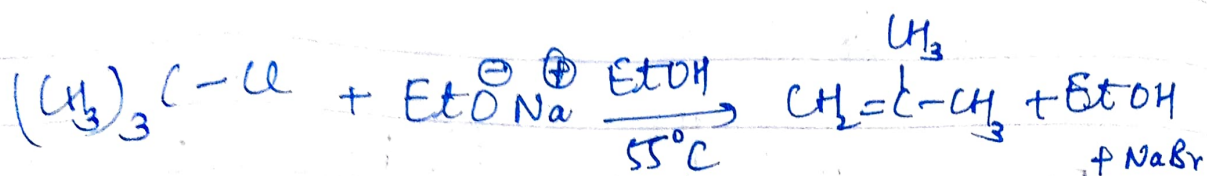
elimination Unimolecular Conjugate base



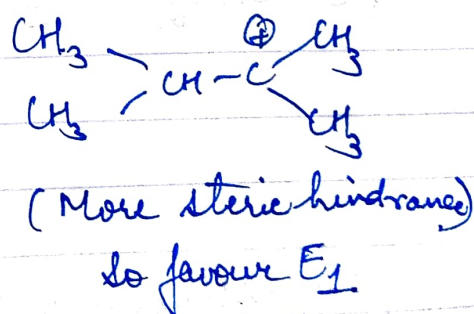
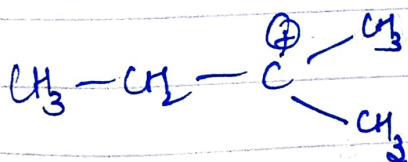
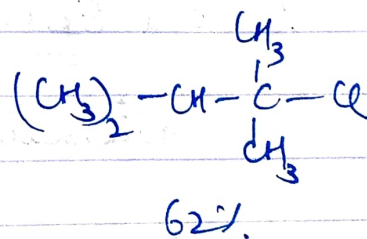
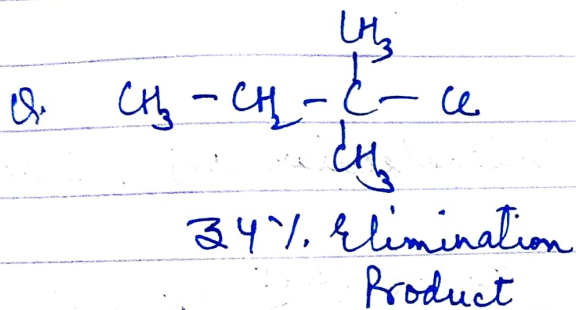
1,1,1-trifluoro-2,2-dichloroethane, do exchange of Deuterium instead of dehydrofluorination which is possible only through $E1cB$.

C-F strong bond $\therefore$ F do not exit after removal of H.

E₁ Rxn:-

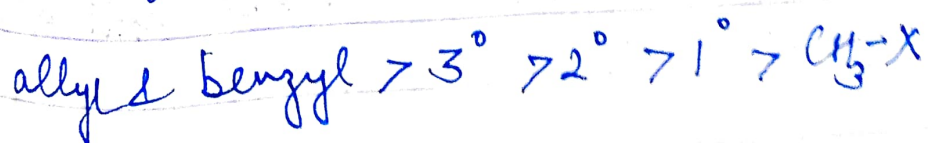


$$r \propto [(\text{CH}_3)_3\text{C}-\text{Cl}]$$

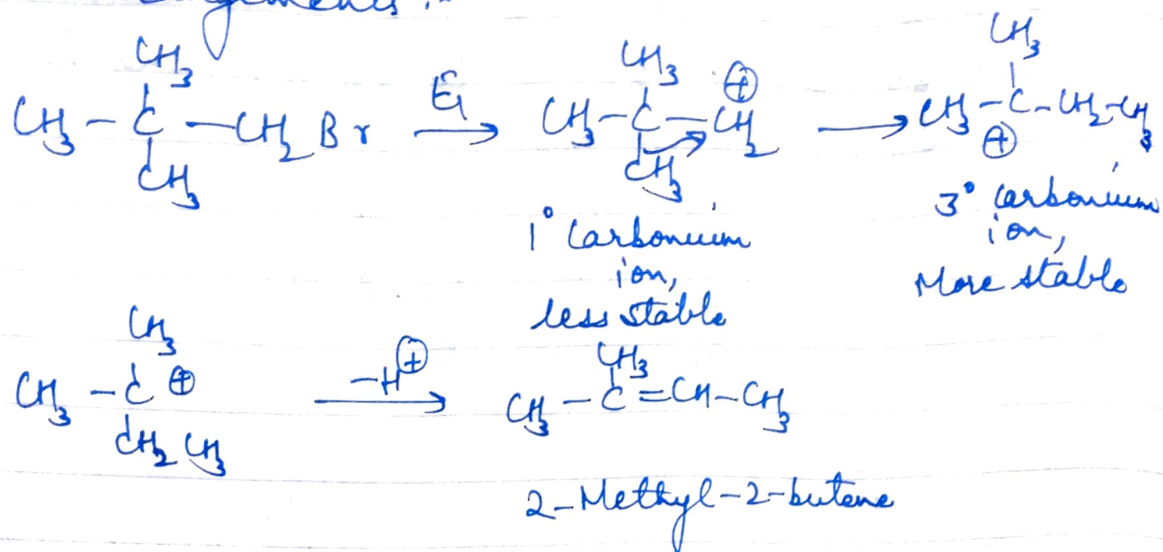


Evidences in favor of E₁:-

a) Effect of structure of alkyl halides:-

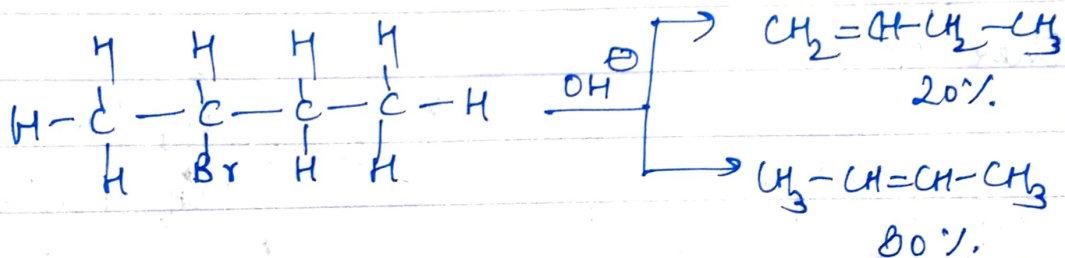


ii) Rearrangements :-



Wagner-Meerwein Rearrangement

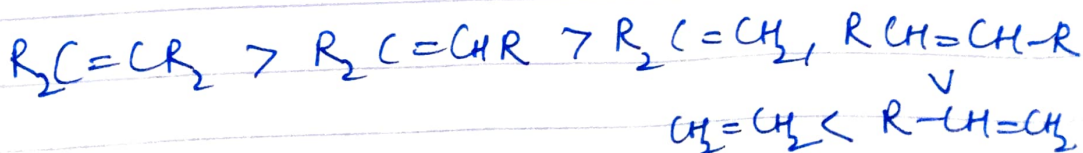
Configuration of Elimination Rxns



i) Saytzeff's Rule

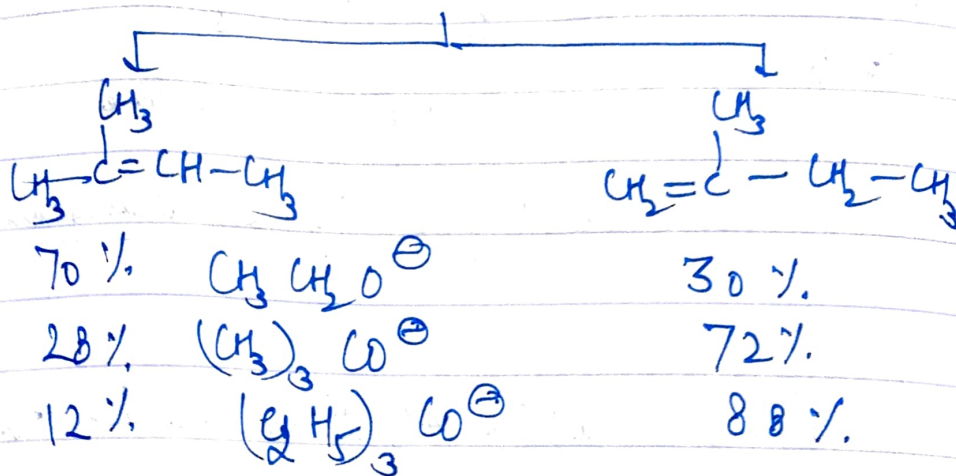
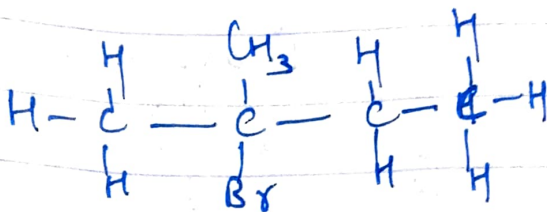
ii) Hofmann's Rule

Saytzeff's Rule $\rightarrow$ H removal from that Carbon which has less no. of hydrogen or we can say ^{= bond} Carbon having more no. of alkyl gps form in higher amount.

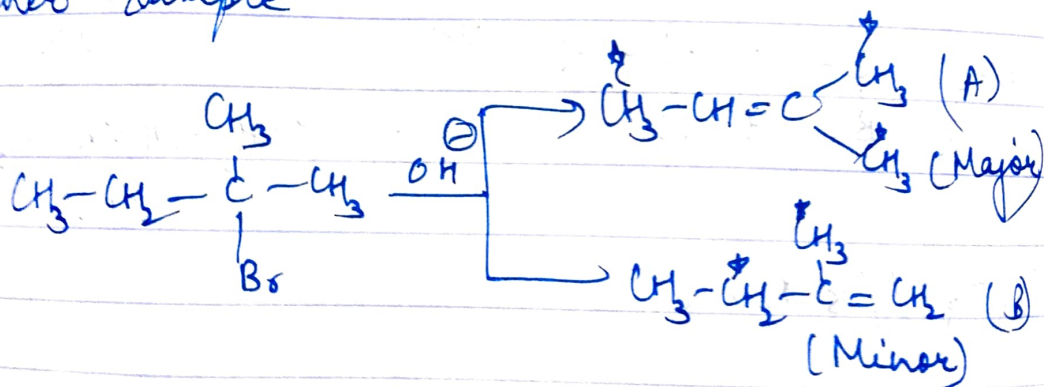


Exception:-

If the base used in the elimination is very bulky & proton to be eliminated is sterically hindered.



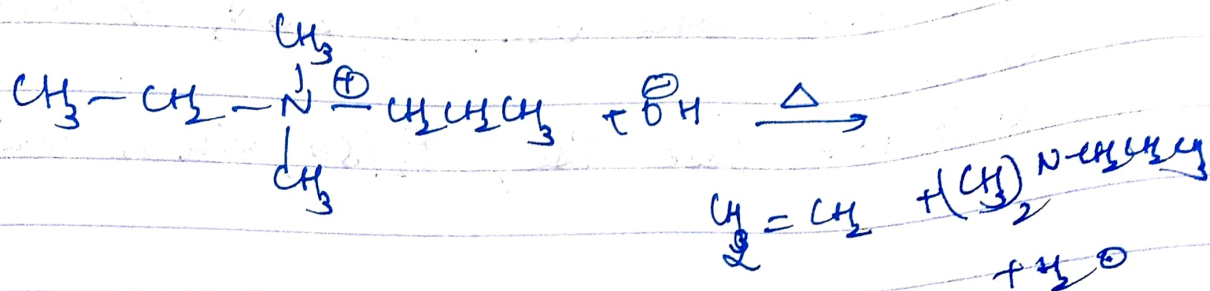
Another example



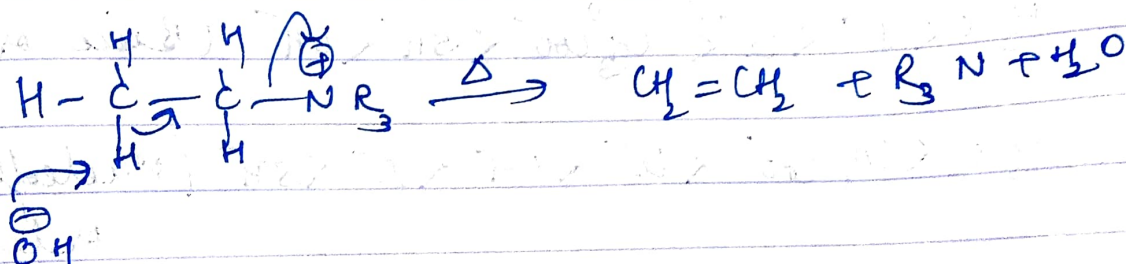
In (A), 9 C-H bond participate in hyperconjugation
 In (B), 5 C-H " " " " " "

II Hofmann Rule:-

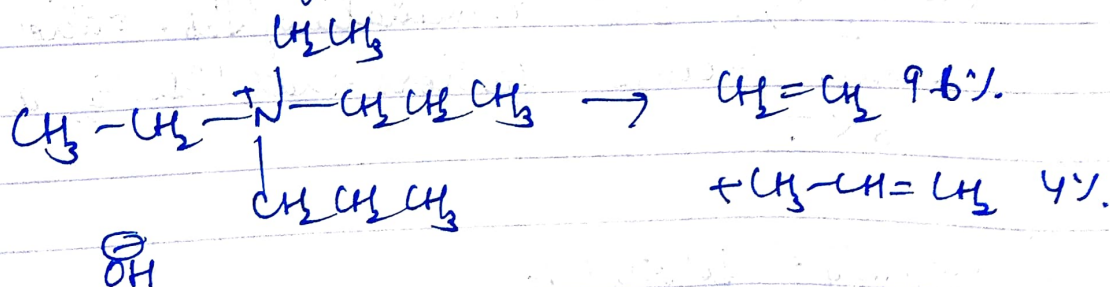
→ Quaternary base give that alkene in high amount having less alkyl gp on = bonded carbon.



Mech:-



Hofmann rule is applicable on Quaternary ammonium & sulfonium salts.



Carbanion $1^\circ > 2^\circ > 3^\circ$ (More stable) Hofmann elimination