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# Organic Chemistry I (CHEM2210) - Summary of Organic Chemistry I Reactions

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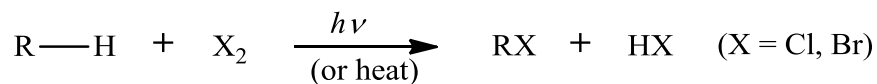
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Summary of Organic Chemistry I Reactions. The letter in brackets, [X], designates the type of reaction mechanism.

## REACTIONS OF ALKANES

### Halogenation

1. [F]

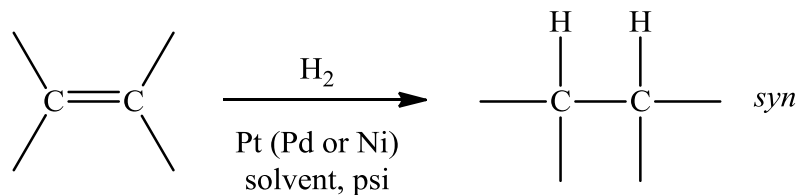


Note: Bromine is more selective than chlorine. Chlorine is more reactive than bromine. Heat or light has to be present.

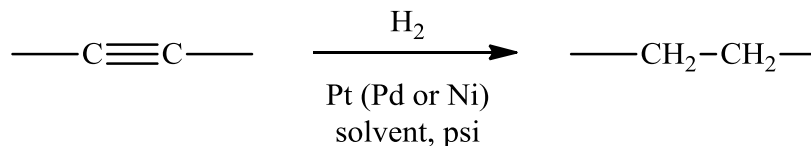
## SYNTHESIS OF ALKANES

### Reduction /Hydrogenation

2. [R]

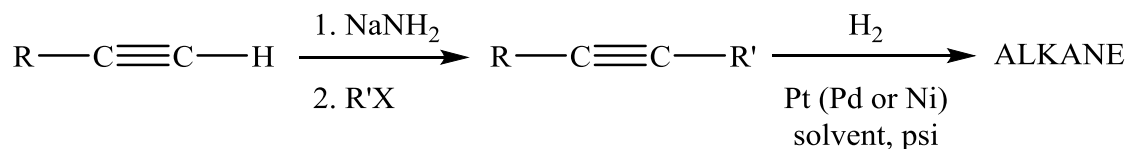


3. [R]



### Other Alkane Synthesis

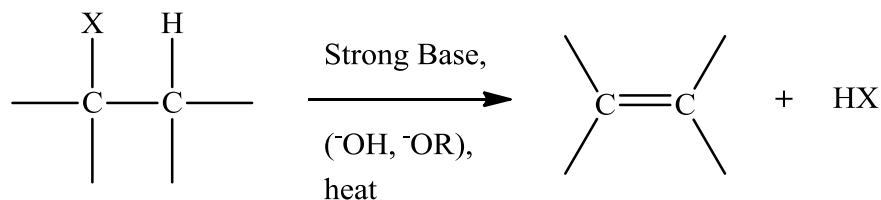
4. [A/B, S, R] Note: C-C bond formation



## SYNTHESIS OF ALKENES AND ALKYNES

### Dehydrohalogenation

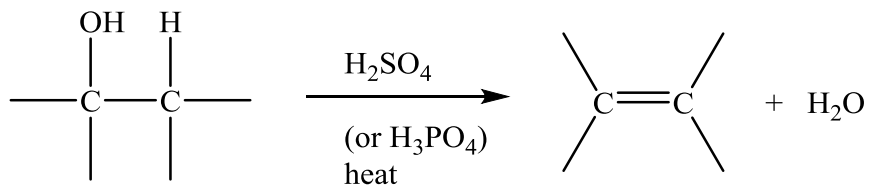
5. [E]



Note: More stable alkene is formed unless a bulky base such as *tert*-BuO<sup>-</sup>K<sup>+</sup> is used.

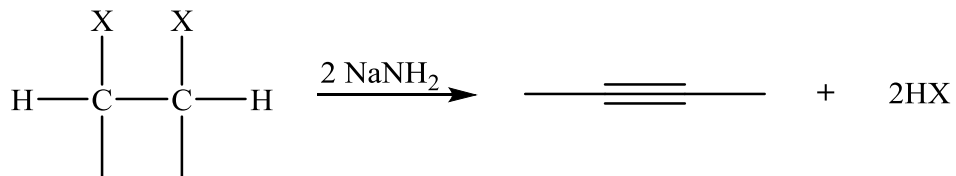
### Alcohol Dehydration

6. [E]



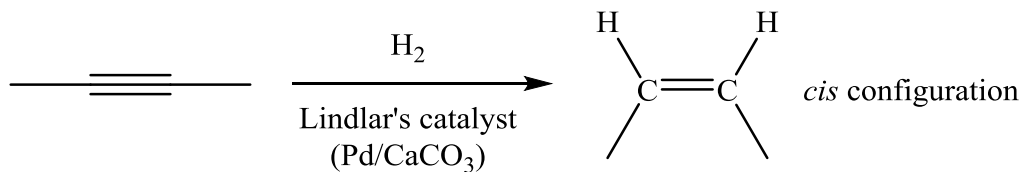
### Di-Dehydrohalogenation

7. [E]



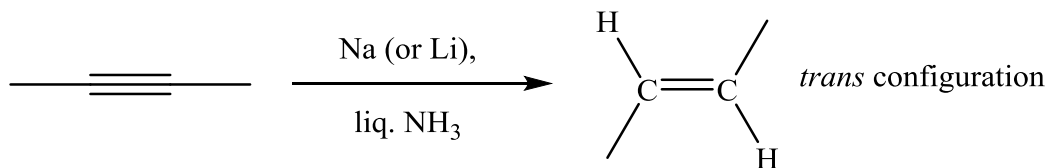
### Partial reduction of Alkynes

8. [R]



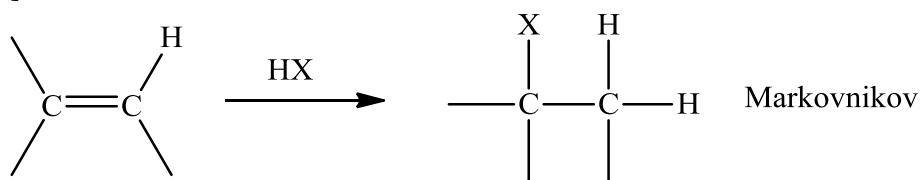
Other catalysts: Ni<sub>2</sub>B or P2

9. [R]

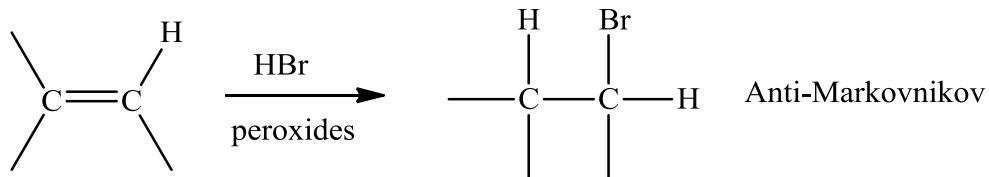


### REACTIONS OF ALKENES AND ALKYNES

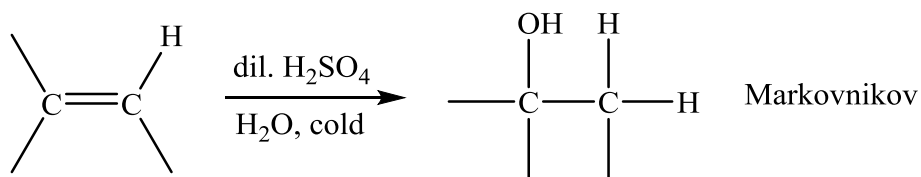
10. [EA]



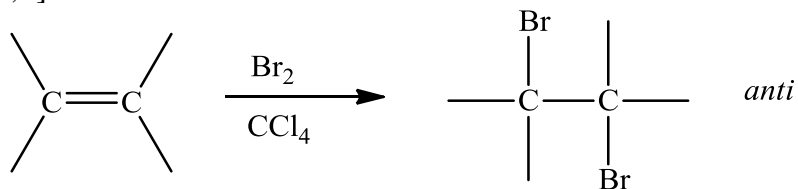
11. [F]



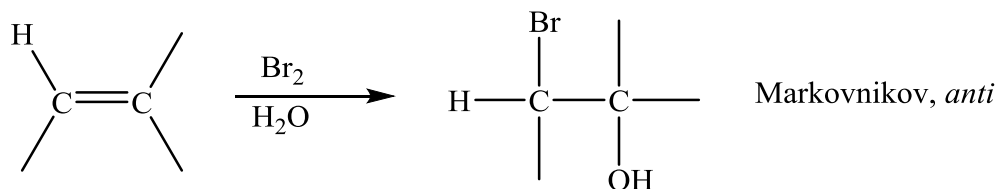
12. [EA]



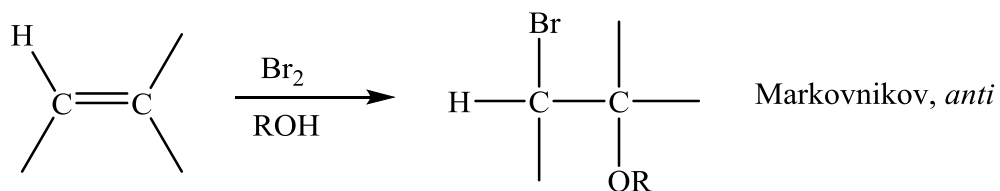
13. [EA,S]



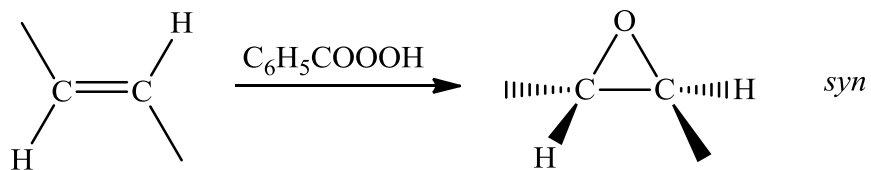
14. [EA]



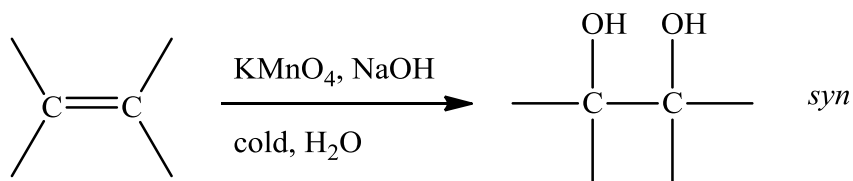
15. [EA]



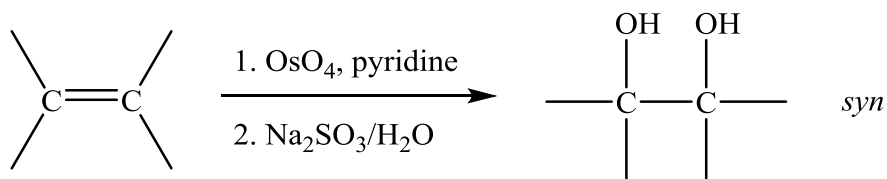
16. [O]



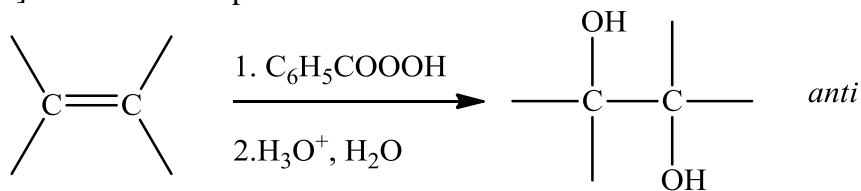
17. [O]



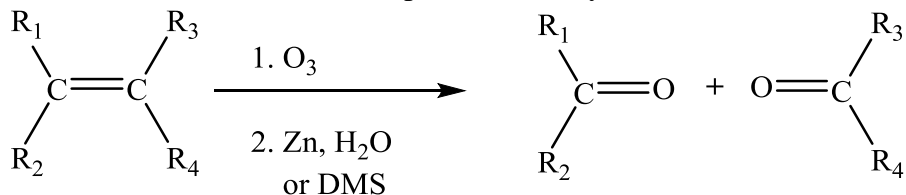
18. [O]



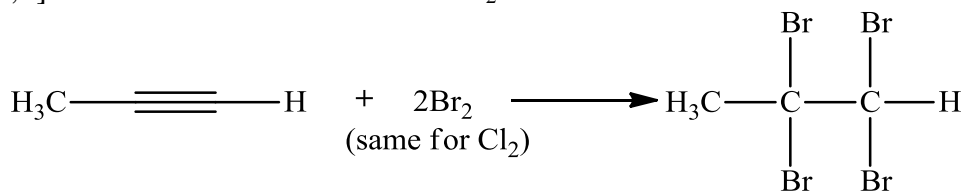
19. [O,S] Note: an epoxide forms as an intermediate.



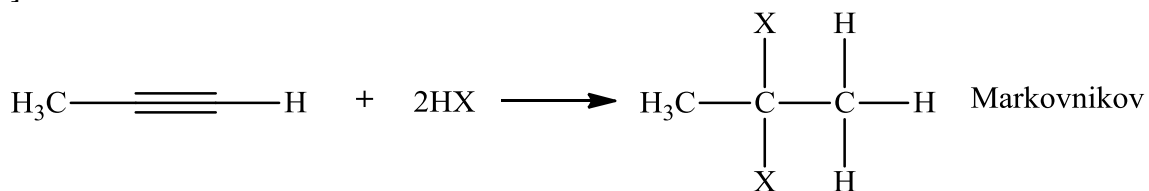
20. [O] Note: The oxidation stops at the aldehyde (RCHO), if formed.



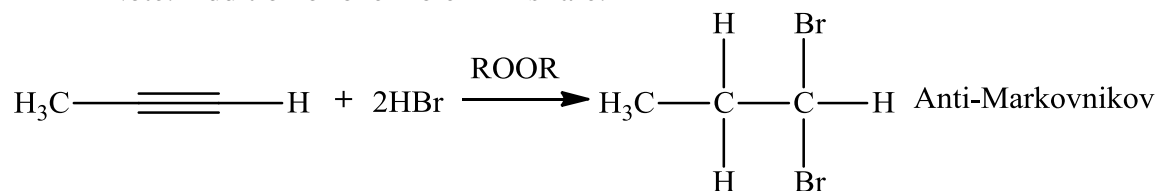
21. [EA,S] Note: Addition of one mole X<sub>2</sub> is rare.



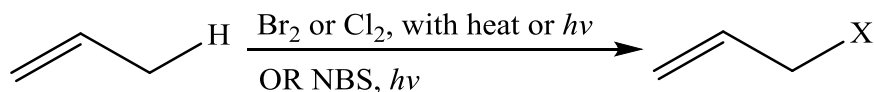
22. [EA] Note: Addition of one mole HX is rare.



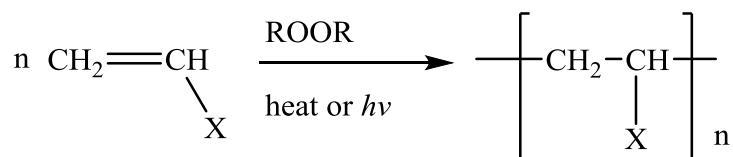
23. [F] Note: Addition of one mole HX is rare.



24. [F]

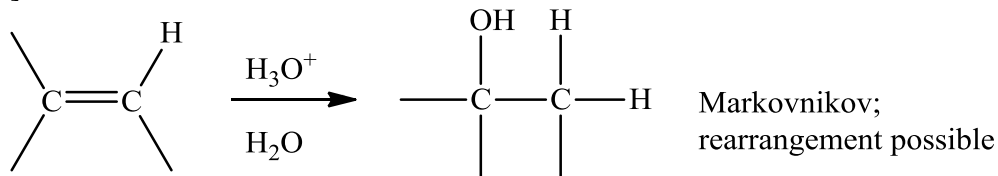


25. [F]

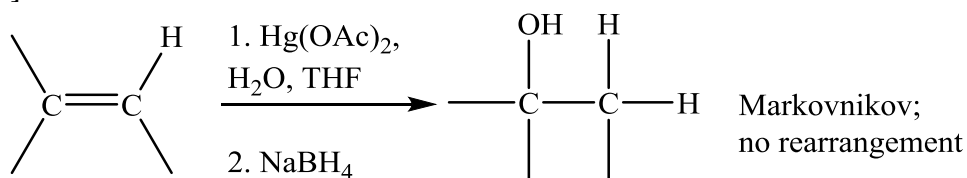


#### ALCOHOL SYNTHESIS FROM ALKENES

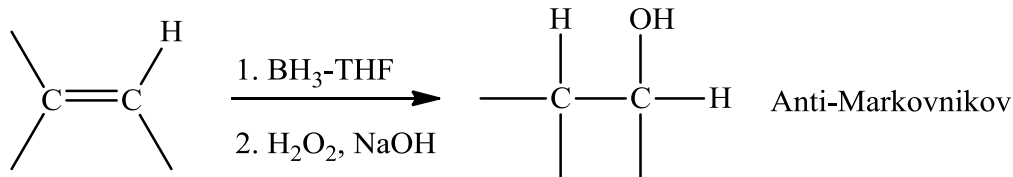
26. [EA]



27. [EA]

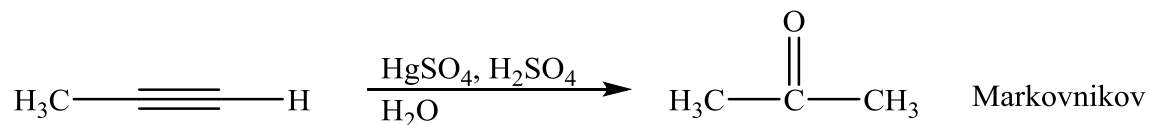


28. [EA]

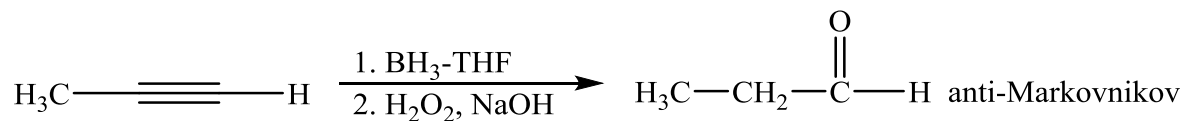


#### ALDEHYDE/KETONE SYNTHESIS FROM ALKYNES

29. [EA]



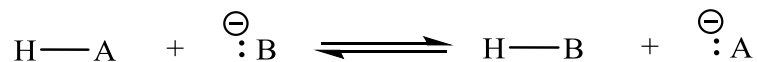
30. [EA]



### OTHER REACTIONS

Acid/Base

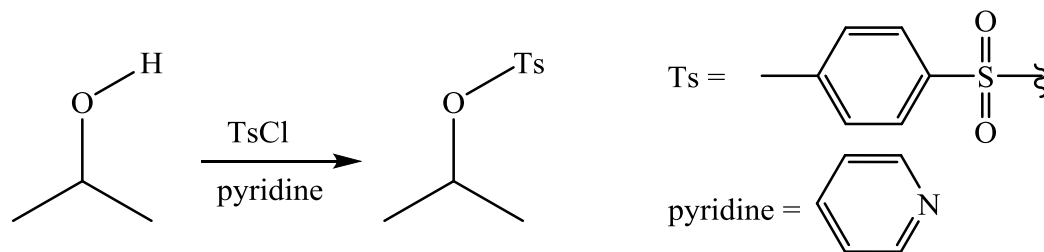
31.



The base may or may not be paired with an alkali metal such as  $\text{Li}^\oplus$ ,  $\text{Na}^\oplus$ , or  $\text{K}^\oplus$ .  
Equilibrium favors the side of the reaction with the weaker acid and weaker base.

Tosylation

32.



Reactions grouped by mechanism

[S]  $\text{S}_{\text{N}}1$  /  $\text{S}_{\text{N}}2$ : 4, 13, 18, 20

[E]  $\text{E}1$  /  $\text{E}2$ : 5, 6, 7

[EA] Electrophilic Addition: 10, 12, 13, 14, 15, 21, 22, 26, 27, 28, 29, 30

[F] Free Radical: 1, 11, 23, 24, 25

[R] Reduction: 2, 3, 4, 8, 9

[O] Oxidation: 16, 17, 18, 19, 20

Other Reactions

C—C bond forming reactions: 4, 24

Acid/Base Reactions: 31

Tosylation: 32

GOOD LUCK TO YOU ALL