

Name \_\_\_\_\_

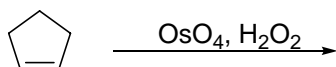
**If you do not want your graded quiz placed in the box outside my office, then please tick here \_\_\_\_\_**

(1-10) are True or False.

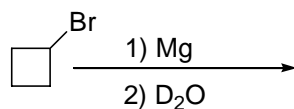
- 1) All alkynes contain sp hybridized carbons.
- 2) An alcohol contains an oxygen – hydrogen sigma bond.
- 3) A triple bond consists of two  $\pi$  bonds and one  $\sigma$  bond.
- 4) The use of a dialkylperoxide as a free radical initiator allows the addition of hydrogen bromide to an alkene double bond to proceed with anti-Markovnikov orientation.
- 5) Hydrogenation (using Lindlar's catalyst) of alkynes gives cis alkenes, whereas the treatment of alkynes with sodium metal and liquid ammonia gives trans alkenes.
- 6) The addition of HBr to an alkyne triple bond is an example of electrophilic addition.
- 7) A Grignard reagent is a source of nucleophilic carbon.
- 8) An organolithium reagent is a source of nucleophilic carbon.
- 9) Organometallic species are usually strong nucleophiles and bases.
- 10) Epoxides have more ring strain than ketones.

(11-15) Draw the products of the following reactions, paying attention to any stereo-/regio-chemistry.

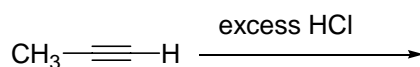
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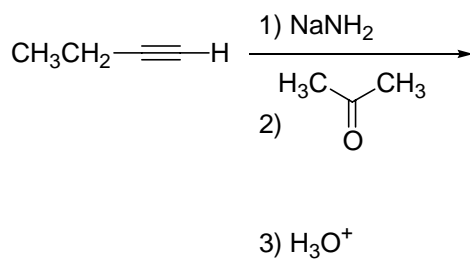
12)



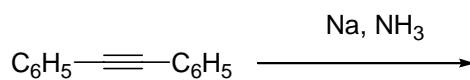
13)



14)

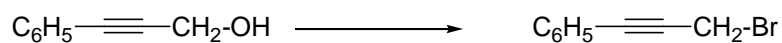


15)

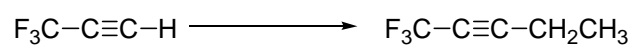


(16-20) Give suitable reagents for the following transformations.

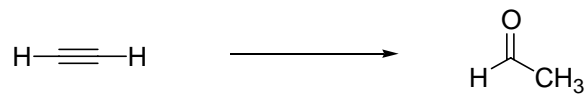
16)



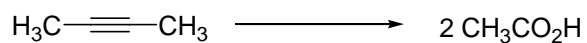
17)



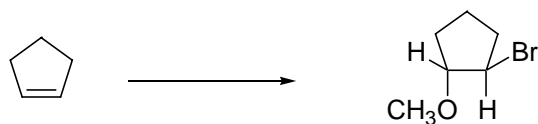
18)



19)



20)



**\*Bonus Question\*** Below is a carbene, explain why this reactive species shows both nucleophilic and electrophilic properties (up to 2 points).



Name WADE DOWNLOW SCORES

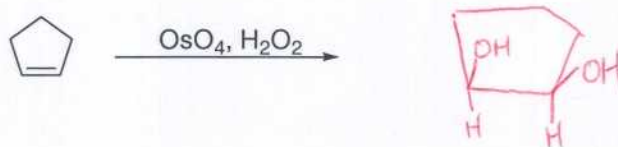
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(1-10) are True or False.

- 1) All alkynes contain sp hybridized carbons. T
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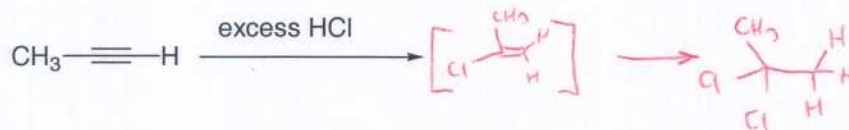
11)



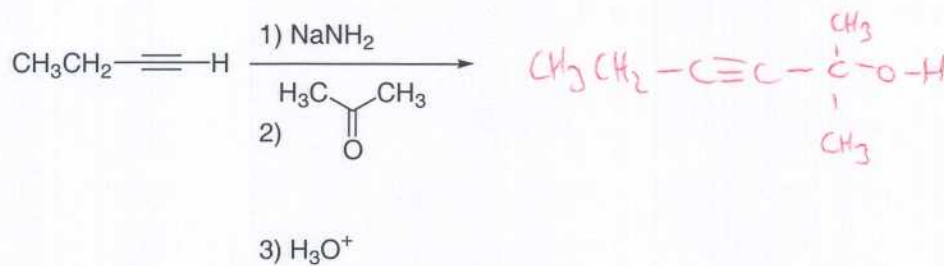
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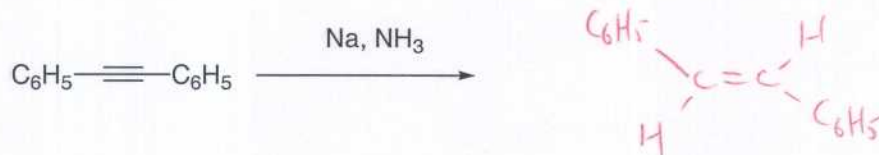
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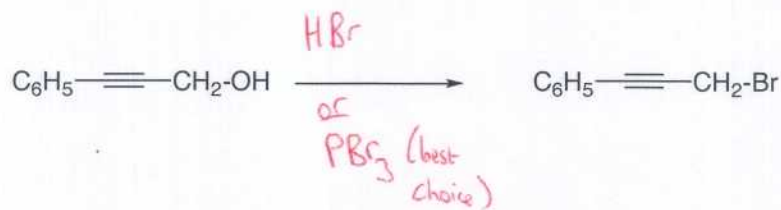


15)

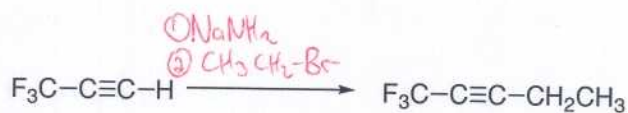


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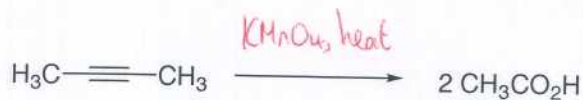
17)



18)



19)



20)



**\*Bonus Question\*** Below is a carbene, explain why this reactive species shows both nucleophilic and electrophilic properties (up to 2 points).



$:\text{CH}_2$  has  $\text{sp}^2$  hybridization of the central carbon. The lone pair ( $\text{sp}^2$  orbital) gives rise to nucleophilic characteristics, whereas the empty, unhybridized p orbital is able to accept a pair of electrons which is electrophilic behaviour. Hence a carbene displays both nucleophilic and electrophilic properties.