

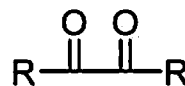
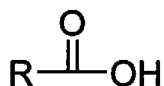
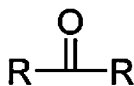
Name _____

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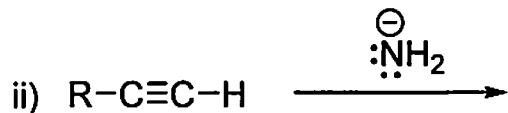
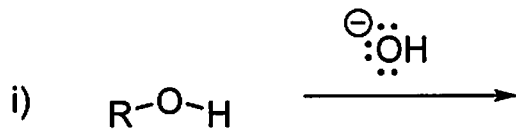
1-10 Are True/False (10pts)

- 1) All alkanes have a Carbon-Carbon triple bond.
- 2) A typical Carbon-Carbon triple bond length is around 1.2×10^{-5} Å.
- 3) The Grignard reagent $\text{CH}_3\text{CH}_2\text{MgBr}$ has 3 lone pairs (non-bonding pairs) of valence electrons.
- 4) Cyclobutanol is an achiral, secondary alcohol.
- 5) Tertiary alcohols are easily oxidized.
- 6) Terminal alkynes have a Hydrogen connected to an sp hybridized Carbon.
- 7) But-1-yne is more acidic than But-2-yne.
- 8) Primary alcohols can be oxidized to aldehydes and carboxylic acids.
- 9) *Enols* are unstable, and will tautomerize into their more stable *keto* form.
- 10) The oxygen in ethanol is sp^3 hybridized.

11) Identify the following three functional groups. (3pts)



12) (2+2+1+1 = 6pts) a) Draw **all** the products of the following acid-base reactions.



b) Draw in the curly arrows to show the mechanism for **either** i) **or** ii).

c) Indicate (or state) the *acidic* species in part i).

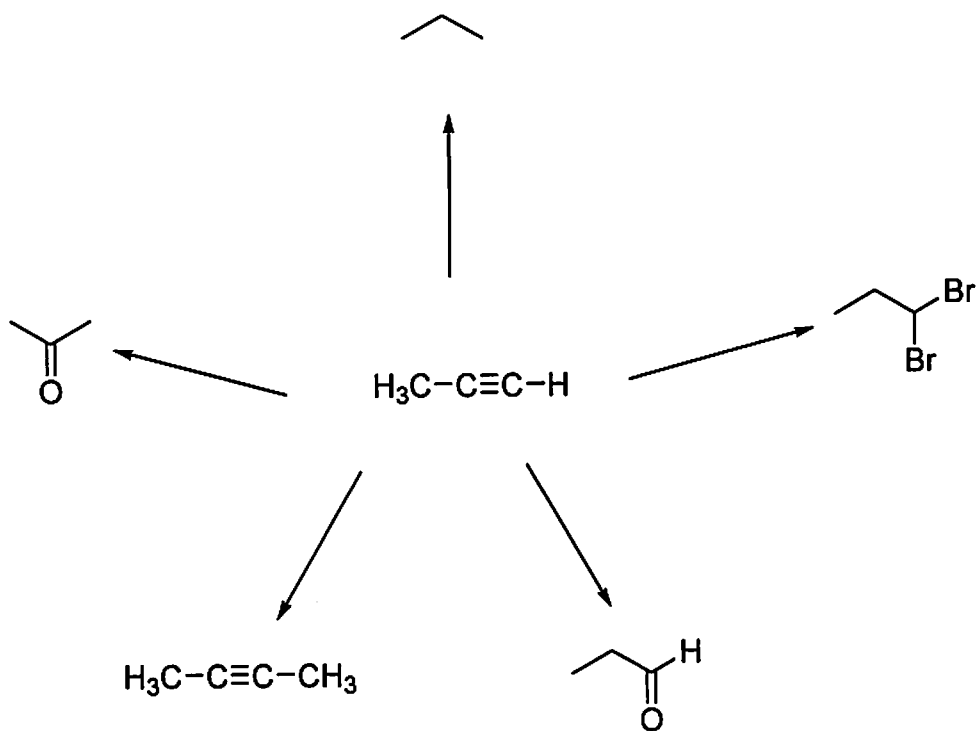
d) Which reaction (i or ii) produces an *acetylide*?

13) Using any appropriate method or representation (line angle, Lewis, sticks and wedges, etc.) draw *1-methylcyclopropanol*. (2pts)

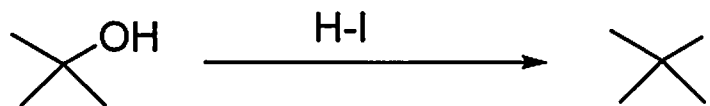
14) Provide the full IUPAC name for following molecule. (2pts)



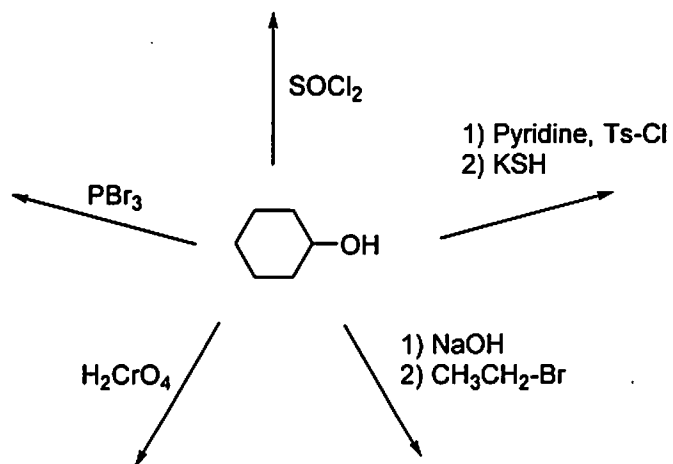
15) Provide reagents to achieve the following transformations. (10 pts)



16) Draw curly arrows to show the mechanism of the following reaction.
(4pts)

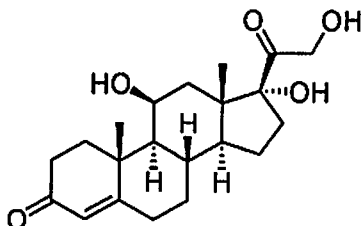


17) Provide the products in the following alcohol reactions. (10pts)



18) (3pts) The following molecule is a steroid hormone produced in humans, which plays a significant role in your immune system, including responses to stress and inflammation. It can also be applied as a medication known as “hydrocortisone”.

This ALCOHOL is produced in your adrenal CORTEX, which explains its more common name of *cortisol*.

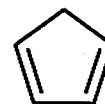


- How many alcohol functional groups are present in cortisol?
- How many are *primary* alcohols?
- How many of the OH's are directly connected to chiral centers?

*****Up to 3 BONUS points*****

Provide suitable reagents you could use to achieve the following multistep transformation.

Cyclopentanol



Name _____

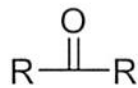
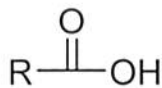
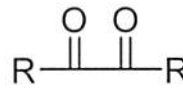
BHATHO BIEL

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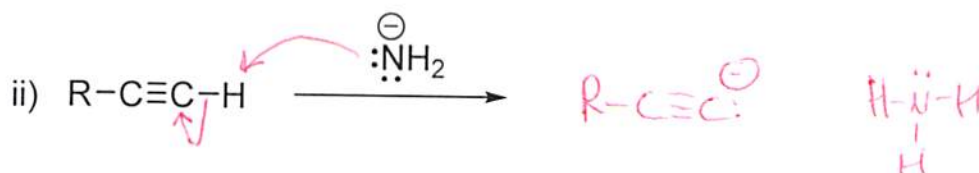
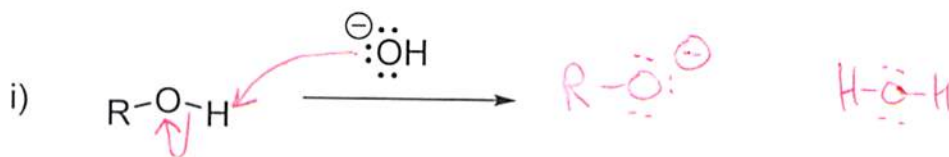
1-10 Are True/False (10pts)

- 1) All alkanes have a Carbon-Carbon triple bond. *False*
- 2) A typical carbon-carbon triple bond length is around 1.2×10^{-5} Å. *False*
- 3) The Grignard reagent $\text{CH}_3\text{CH}_2\text{MgBr}$ has 3 lone pairs (non-bonding pairs) of valence electrons. *T*
- 4) Cyclobutanol is an achiral, secondary alcohol. *T*
- 5) Tertiary alcohols are easily oxidized. *False*
- 6) Terminal alkynes have a Hydrogen connected to an sp hybridized Carbon. *T*
- 7) But-1-yne is more acidic than But-2-yne. *T*
- 8) Primary alcohols can be oxidized to aldehydes and carboxylic acids. *T*
- 9) *Enols* are unstable, and will tautomerize into their more stable *keto* form. *T*
- 10) The oxygen in ethanol is sp^3 hybridized. *T*

11) Identify the following three functional groups. (3pts)

*Ketone**Carboxylic Acid**Diketone*

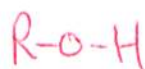
12) (2+2+1+1 = 6pts) a) Draw **all** the products of the following acid-base reactions.



b) Draw in the curly arrows to show the mechanism for **either** i) **or** ii).

Above

c) Indicate (or state) the *acidic* species in part i).



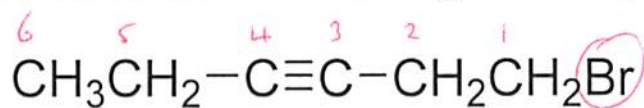
d) Which reaction (i or ii) produces an *acetylide*?

(ii)

13) Using any appropriate method or representation (line angle, Lewis, sticks and wedges, etc.) draw *1-methylcyclopropanol*. (2pts)

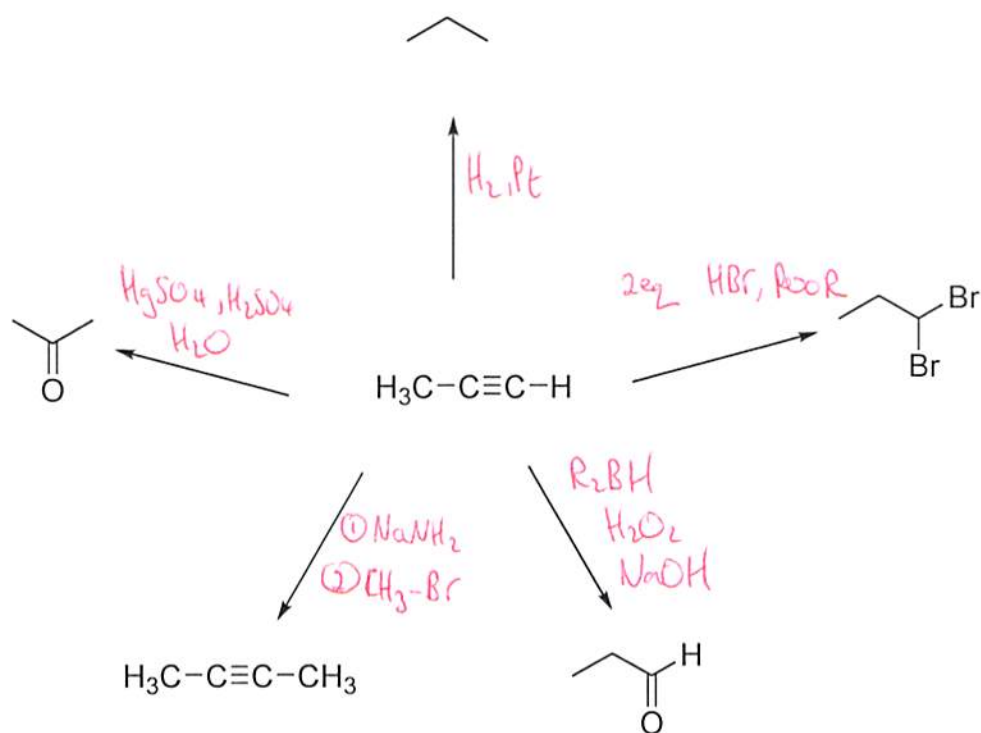


14) Provide the full IUPAC name for following molecule. (2pts)

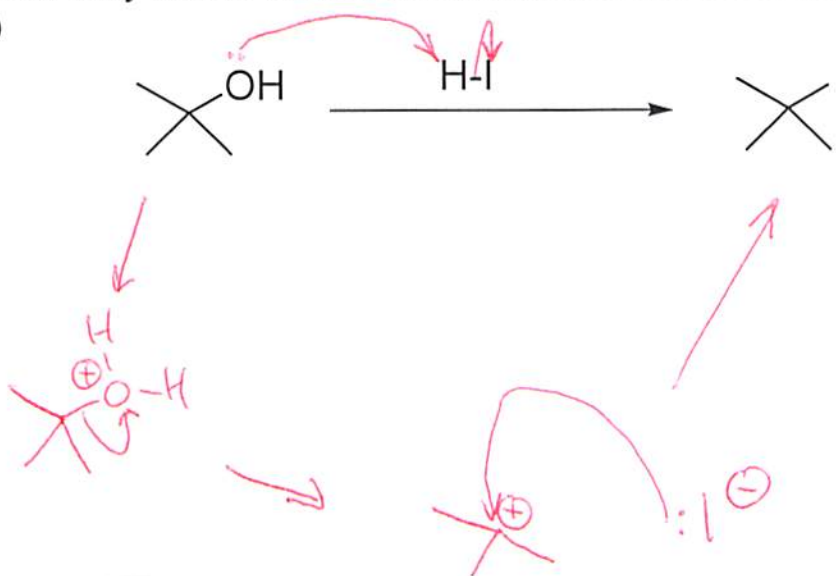


1-BROMOHEX-3-YNE

15) Provide reagents to achieve the following transformations. (10 pts)



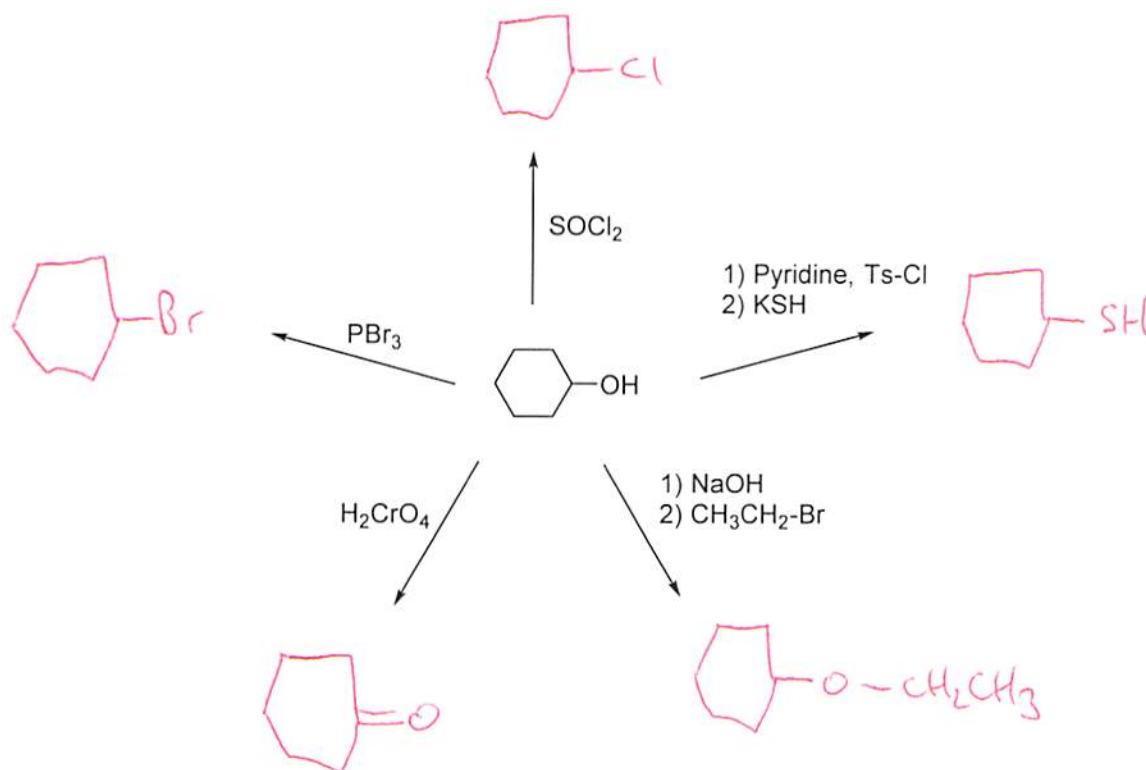
16) Draw curly arrows to show the mechanism of the following reaction.
(4pts)



S_N1 reaction
due to Tertiary.

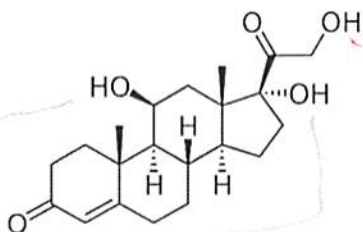
H₂O

17) Provide the products in the following alcohol reactions. (10pts)



18) (3pts) The following molecule is a steroid hormone produced in humans, which plays a significant role in your immune system, including responses to stress and inflammation. It can also be applied as a medication known as “hydrocortisone”.

This ALCOHOL is produced in your adrenal CORTEX, which explains its more common name of *cortisol*.



a) How many alcohol functional groups are present in cortisol?

3

b) How many are *primary* alcohols?

1

c) How many of the OH's are directly connected to chiral centers?

2

*****Up to 3 BONUS points*****

Provide suitable reagents you could use to achieve the following multistep transformation.

