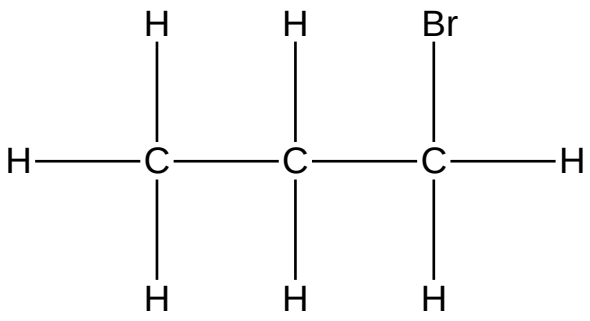
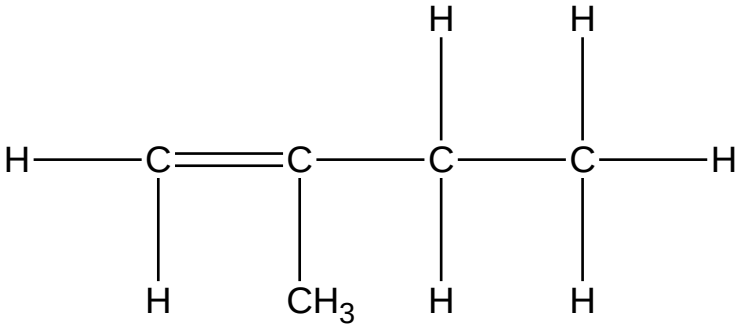
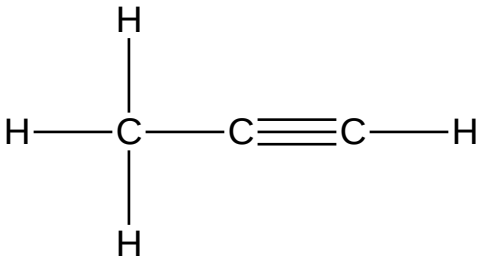
Do now:

Name these compounds:







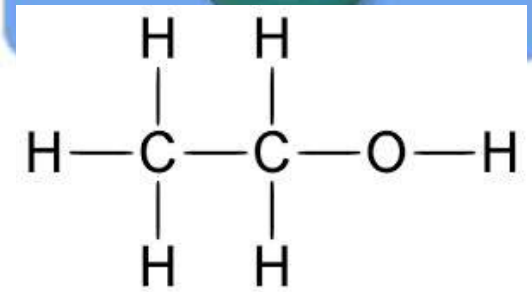
Draw these compounds:

but-2-yne

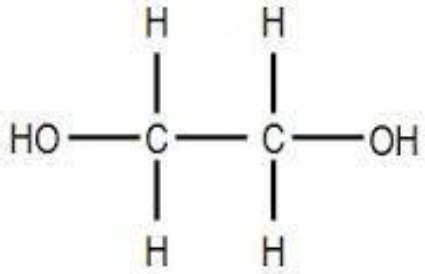
2,2-dichloropropane


MED
ANTISEPTIC
ALCOHOL
HAND RUB

Alcohols




Prestone
ANTIFREEZE/
COOLANT



Alcohols

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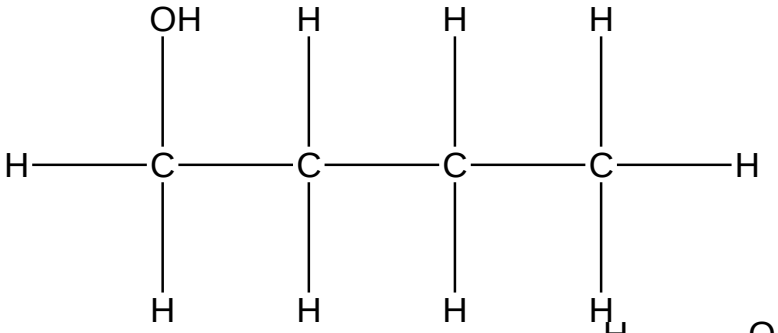
Alcohols contain an – OH group.

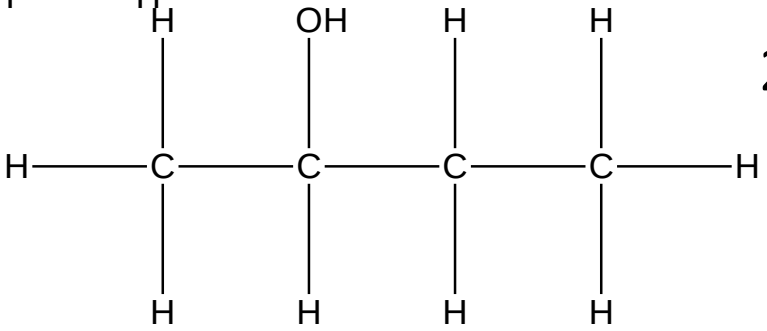
The suffix for alcohols is –ol. Alcohols following the same rules for naming as alkanes, haloalkanes, alkenes and alkynes.

Alcohols can form structural isomers.



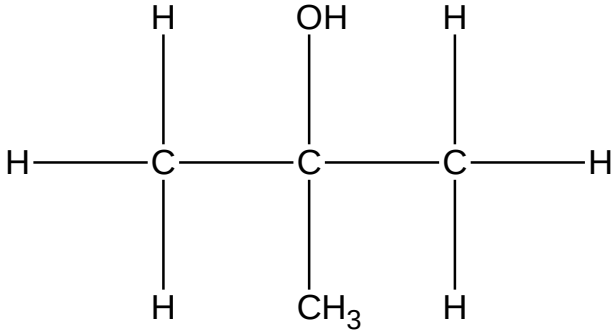
butan-1-ol

C_4H_9OH



butan-2-ol

C_4H_9OH



2-methylpropan-2-ol

C_4H_9OH

Classification of alcohols

Just like haloalkanes, we can classify alcohols as primary (1°), secondary (2°) and tertiary (3°).

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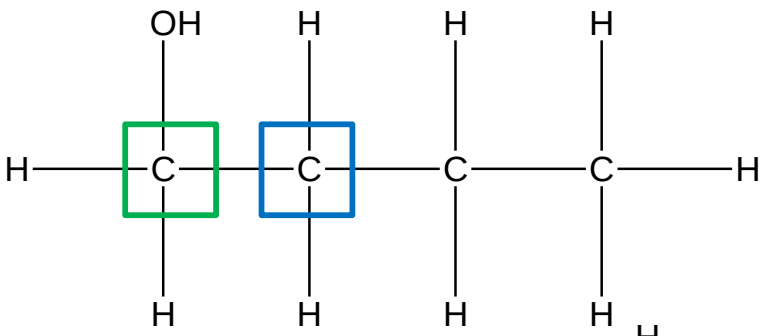
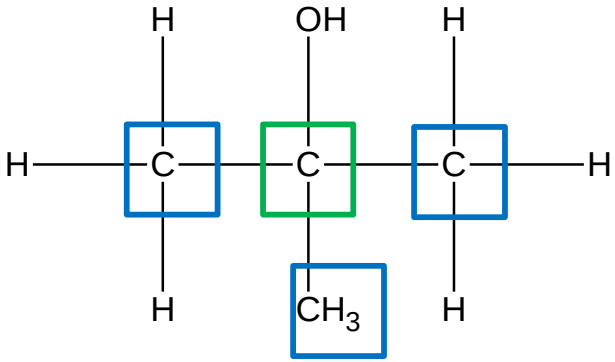
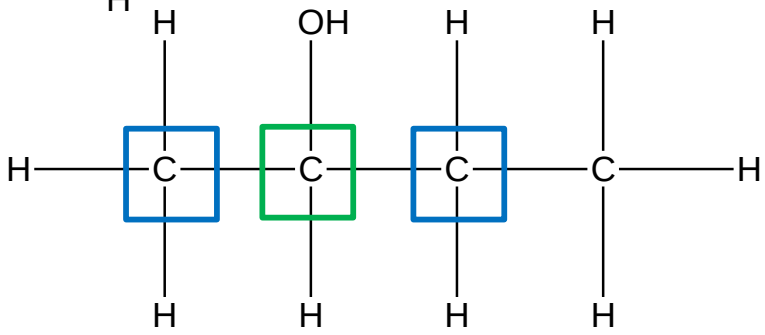


primary (1°)



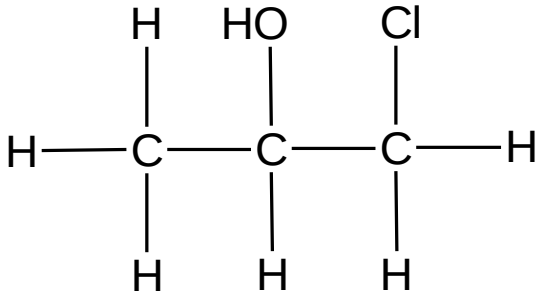
tertiary (3°)

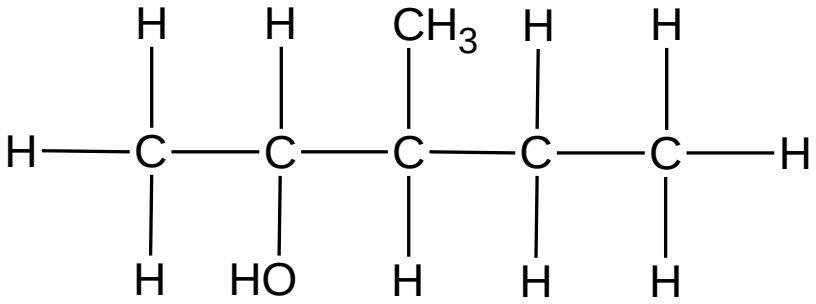


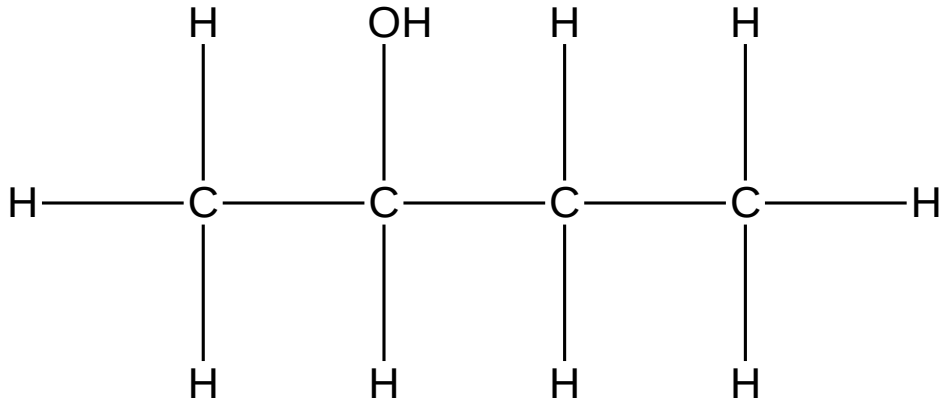
secondary (2°)

Do now:

Name the following alcohols and classify them as primary (1°), secondary (2°) or tertiary (3°).







Properties of alcohols

Alcohols have **higher** melting and boiling points than hydrocarbons because they are **polar** and have **strong** intermolecular forces.

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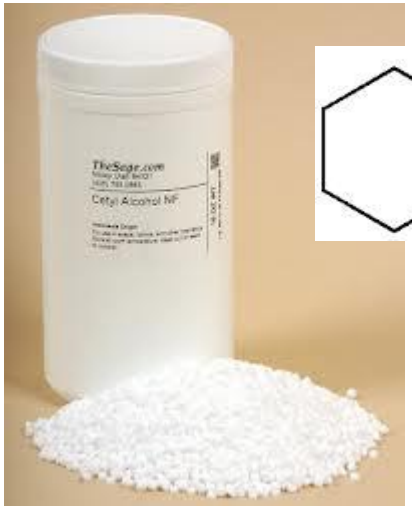
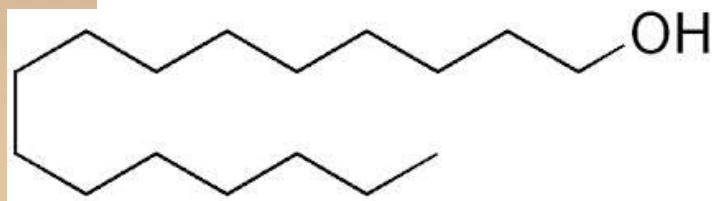
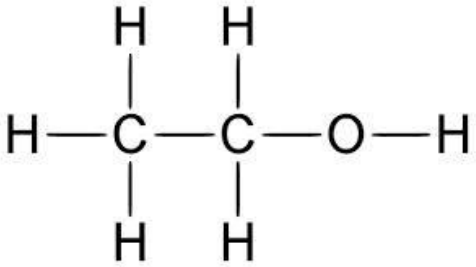
Alcohols with 1 – 4 carbon atoms dissolve in water but alcohols with longer carbon chains do not.

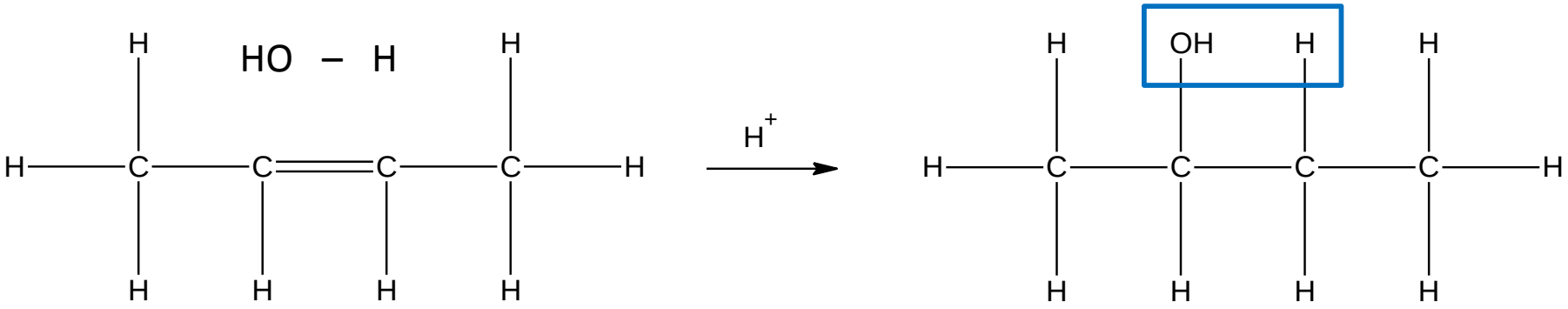






Reactions of alcohols

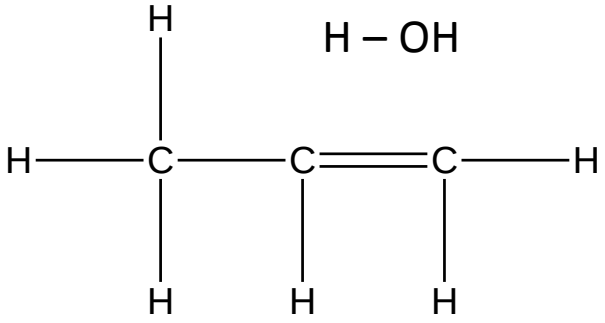
Alcohols can be made from the addition of water to an alkene with an acid catalyst (usually sulfuric acid).

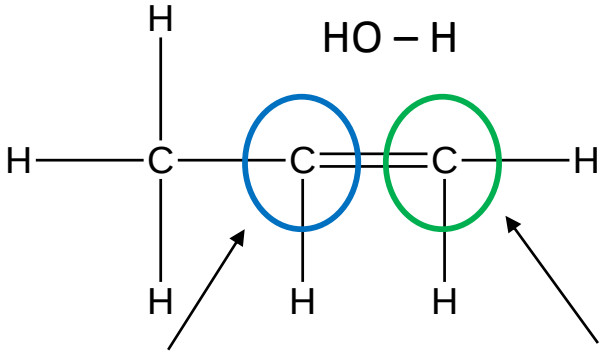


What would be the product from the reaction of 1-chlorobut-2-ene with H_2O/H^+? Draw the reaction and name the product.

Markovnikov's Rule

The preferred product is the product where the hydrogen atom of the reagent is added to the carbon atom in the double bond that is already attached to the most hydrogen atoms.





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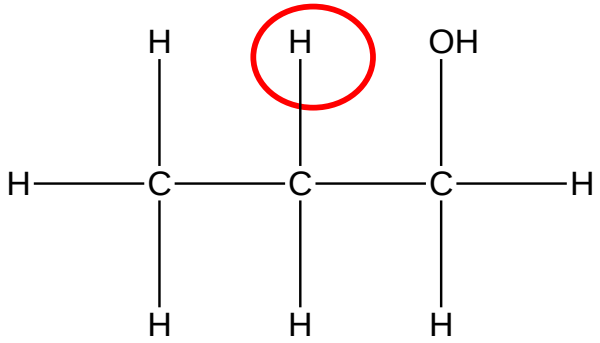
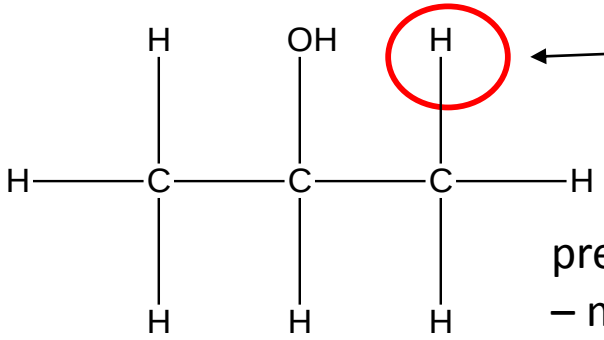
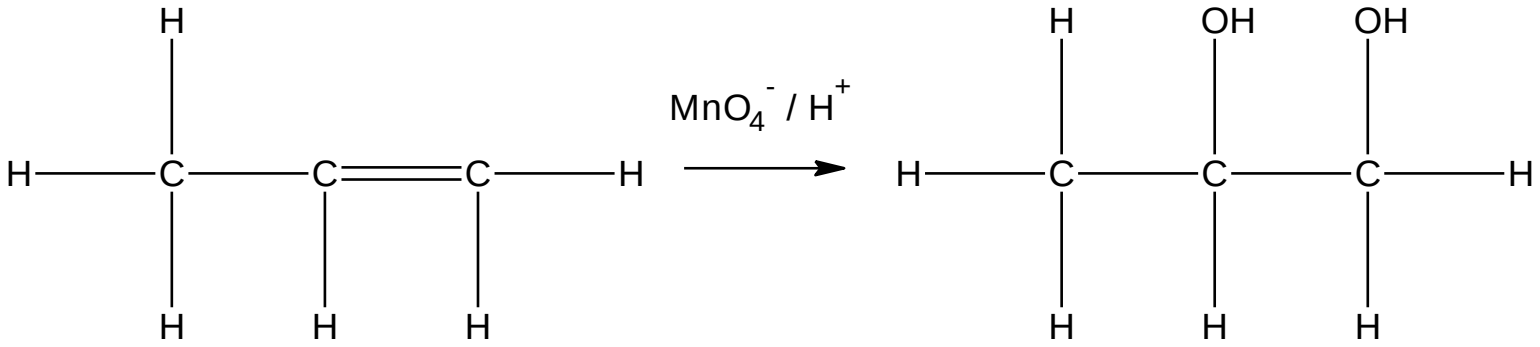
minor product





Reactions of alcohols

Diols (compounds with two alcohol functional groups) can be made from the oxidation of alkenes with MnO_4^-/H^+.



$Cr_2O_7^{2-}/H^+$ is not a strong enough oxidant to do this reaction.

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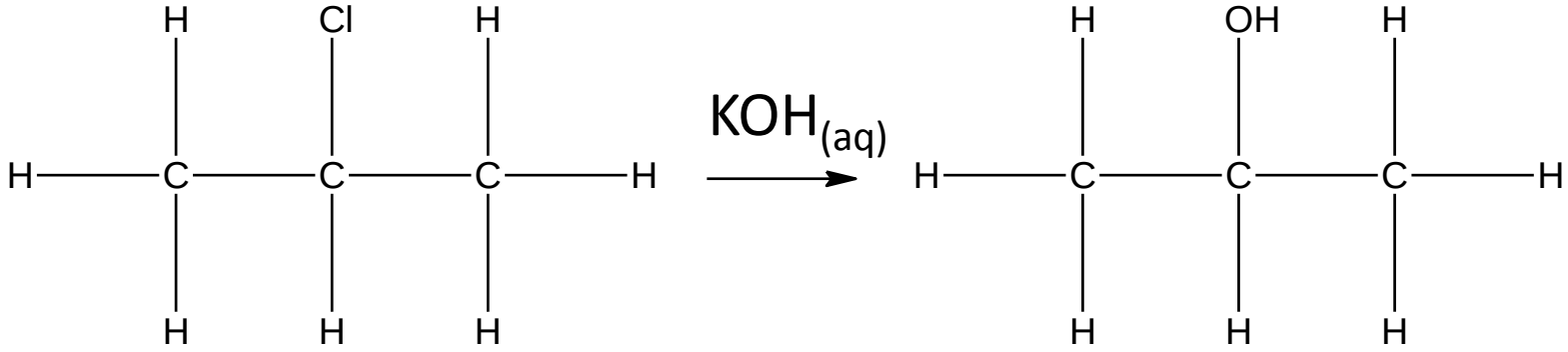
Reactions of alcohols

Alcohols can be made from the substitution of haloalkanes using an aqueous solution of KOH.



Haloalkanes react differently with $KOH_{(alc)}$ and $KOH_{(aq)}$.

alkene

alcohol

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Reactions of alcohols

Alcohols can undergo a substitution reaction with hydrogen halides (HX) to form haloalkanes. Only tertiary alcohols react quickly enough for this to be a useful reaction.

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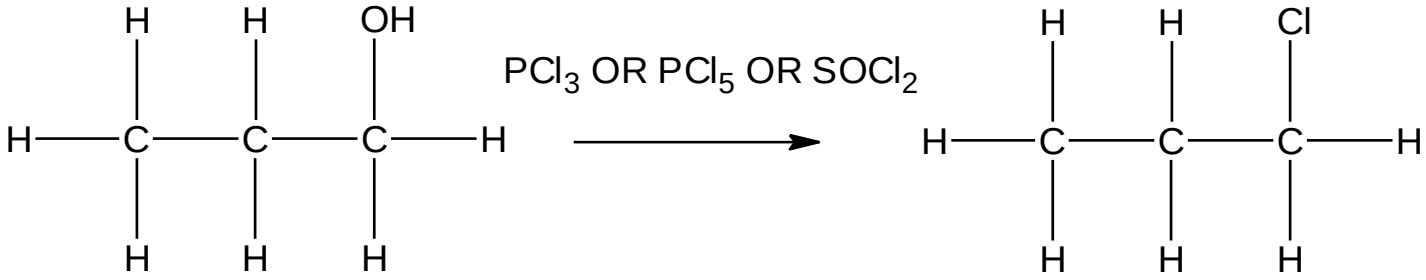
Alcohols can also undergo a substitution reaction with PCl_3, PCl_5 and $SOCl_2$ to form haloalkanes. These three reagents are much better for forming haloalkanes than hydrogen halides.



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Reactions of alcohols

Alcohols can undergo an oxidation reaction with MnO_4^-/H^+ or $Cr_2O_7^{2-}$ to form carboxylic acids.

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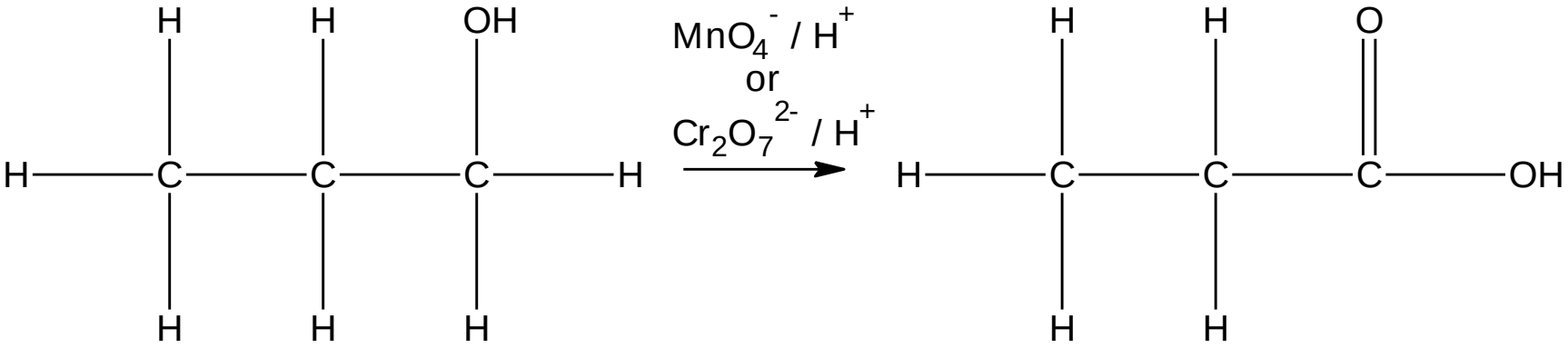
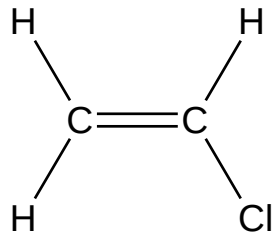


Colour change:

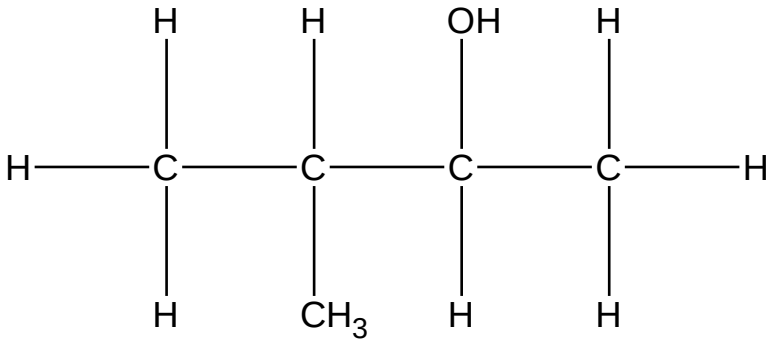
MnO_4^-	purple to colourless
$Cr_2O_7^{2-}$	orange to green

Do now:

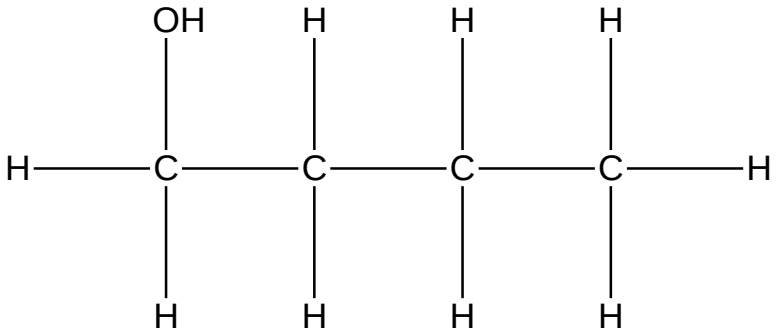
Draw and name the products of the following reactions:
Use your reaction sheet to help you



$KMnO_4/H^+$ →



+ PCl_5 →



conc. H_2SO_4 →

Reactions of alcohols

Alcohols can undergo an elimination reaction with conc. H_2SO_4 to form alkenes.

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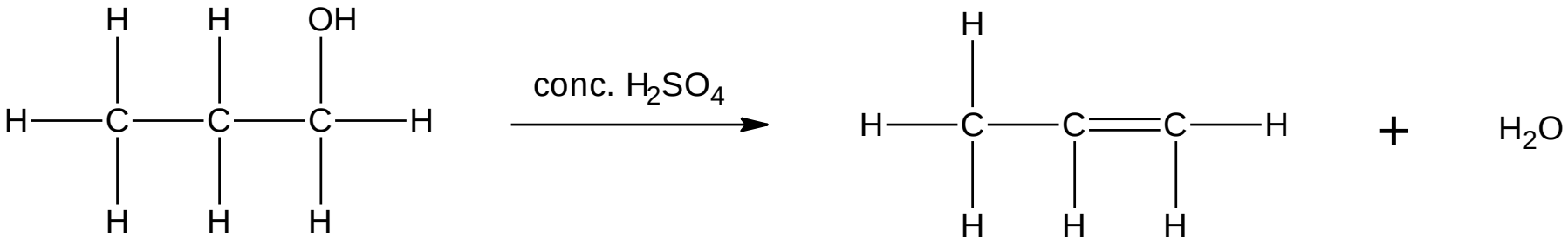


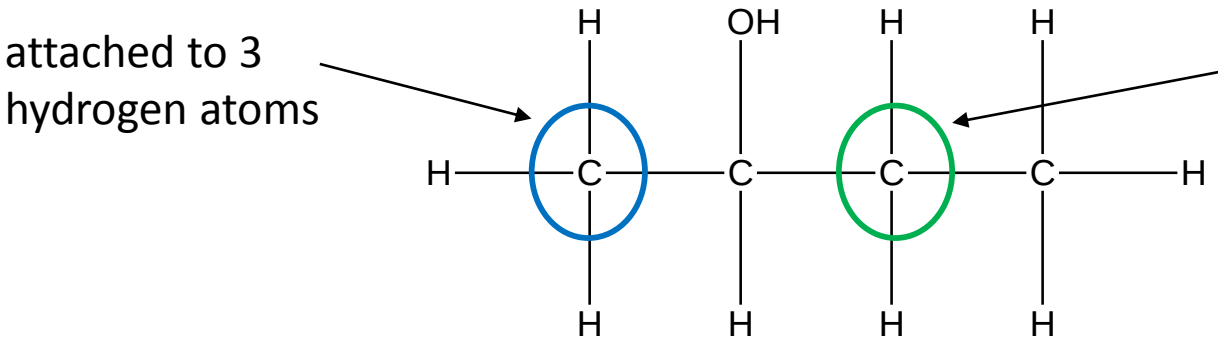
What would be the product from the reaction of pentan-3-ol with the following reagents:

conc H_2SO_4?

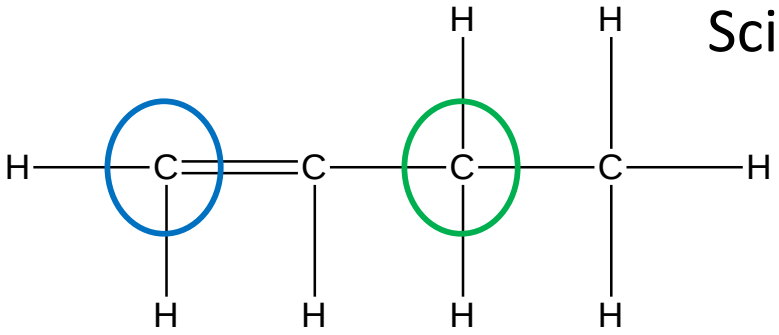
PCl_3

Markovnikov's Rule

The preferred product is the product where the hydrogen atom is eliminated from the carbon atom that is attached to the least number of hydrogen atoms.



minor product



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preferred product – major product