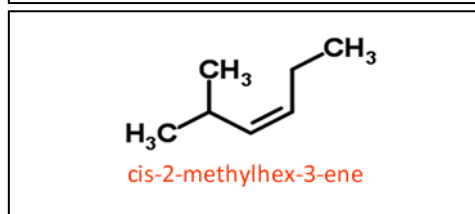
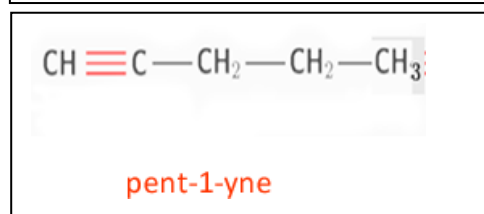
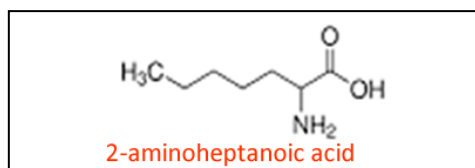
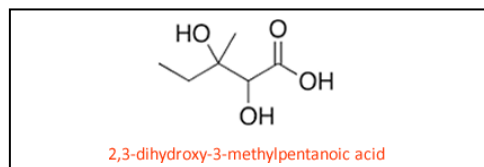
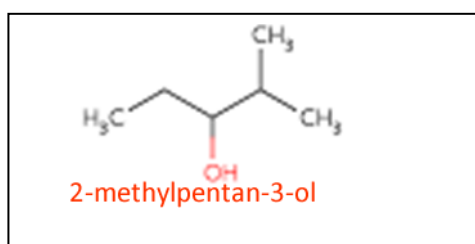
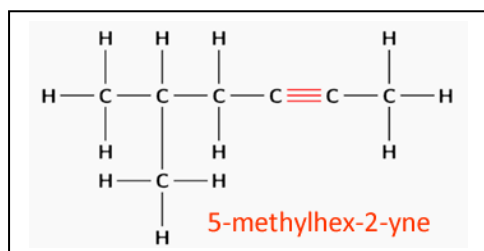
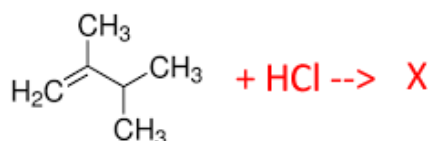


Revision – Organic chemistry – naming, isomers, chiral centres atom economy.

1) Name the following molecules



2) Consider the reaction below.

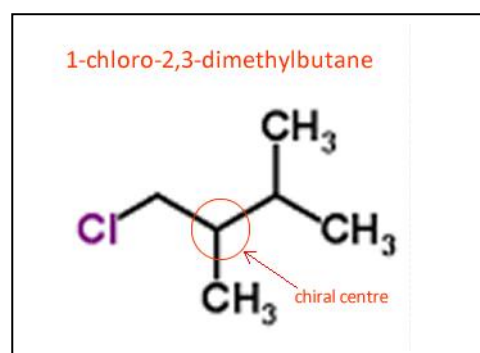


- What type of reaction is the one shown above. *Addition*
- How many structural isomers are possible for X? *2*
- Name each isomer. *1-chloro-2,3-dimethylbutane, 2-chloro-2,3-dimethylbutane*

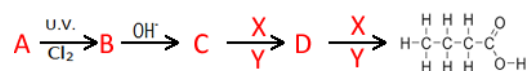
d) Is X a chiral molecule? Explain

*1-chloro-2,3-dimethylbutane has one chiral centre*

*2-chloro-2,3-dimethylbutane has no chiral centres*



3) Consider the reaction pathway given below



a) Identify the following

A *butane*

B *1-chlorobutane*

C *butan-1-ol*

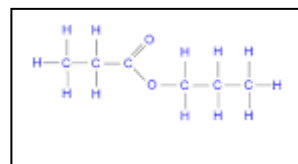
X *Cr<sub>2</sub>O<sub>7</sub><sup>2-</sup>*

Y *H<sup>+</sup>*

4) Consider the following reactions

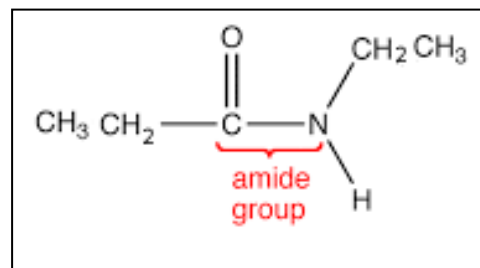
a) Propanol + pentanoic acid → *propyl pentanoate + water*

- Name all the products
- Identify the type of reaction *esterification*
- Draw the structural formula of the major product



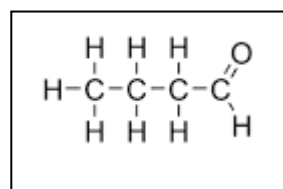
b) Ethanamine + propanoic acid →

- Identify the type of reaction *condensation*
- Draw the structural formula of the major product.
- Calculate the percentage atom economy of this reaction  $(101 / 119.2) \times 100 = 84.7\%$
- What is the functional group present in the major product? *amide*



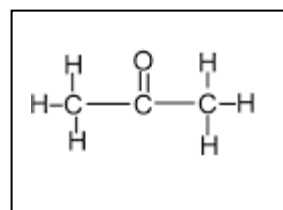
c) Butan-1-ol  $\xrightarrow{\text{Cr}_2\text{O}_7^{2-}/\text{H}}$  *butanal*

- Identify the type of reaction *oxidation*
- Draw the structural formula of the product



d) propan-2-ol  $\xrightarrow{\text{Cr}_2\text{O}_7^{2-}/\text{H}}$  ketone

- What type of alcohol is propan-2-ol *secondary*
- Draw the structural formula of the ketone



5) Consider the molecules below.

a)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$  b)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$  c)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$

- Place the molecules in order of increasing boiling temperature. Explain why

*c) < a) < b)*

- Place the molecules below in order of increasing solubility in water. Explain why  
a) butan-1-ol, b) ethan-1-ol, c) pentan-1-ol

*c) < a) < b)*

6) Consider the molecules shown on the right.

- Circle the chiral centres.
- How many optical isomers does each molecule have?

