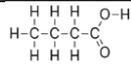
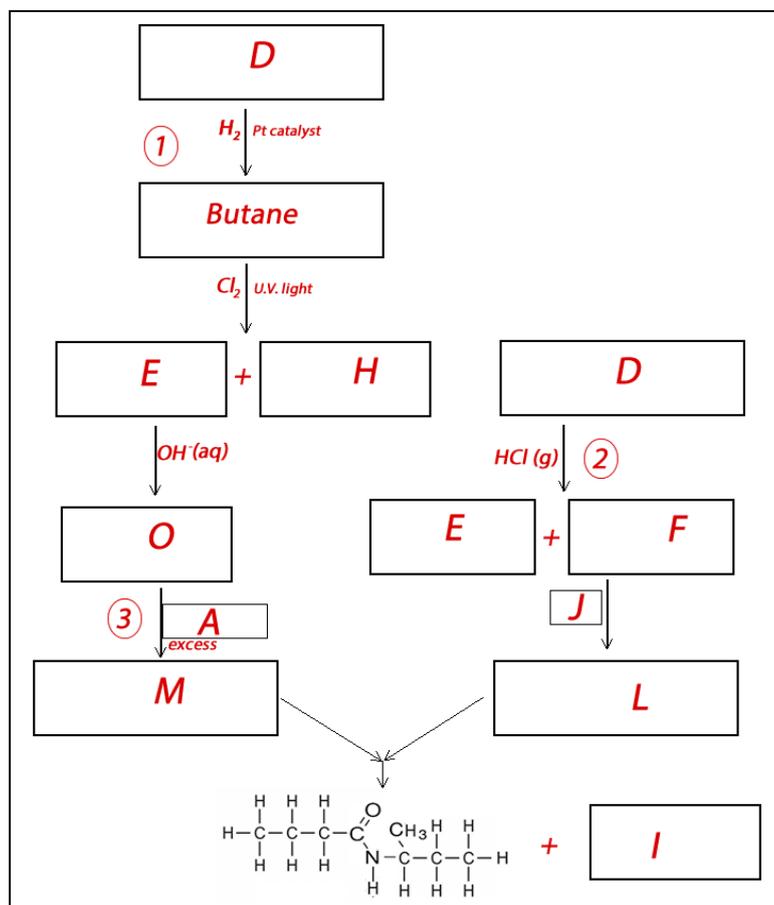


Friday worksheet 12 – organic

- 1) The table below represents available organic substances and inorganic reagents. Selecting from the available items in the table complete the pathways shown below by placing the corresponding letter of the substance in the appropriate box in the diagram. Not all substances are required and some can be used more than once.

Letter	substance
A	Acidified MnO_4^- solution
B	But-2-ene
C	Butane
D	But-1-ene
E	1-chlorobutane
F	2-chlorobutane
G	2-chlorobut-1-ene
H	HCl
I	H_2O
J	NH_3
K	Butan-1-amine
L	Butan-2-amine
M	
N	Pentan-2-amine
O	Butan-1-ol
P	Butan-2-ol
Q	Propanoic acid
S	Ethanoic acid



b. Reaction "1" represents two types of reactions. Name each reaction and justify your answer for each.

Addition reaction - $\text{CH}_2\text{CHCH}_2\text{CH}_3 + \text{H}_2 \rightarrow \text{Butane}$ this is clearly an addition reaction where H_2 is added across the double bond in the presence of a Pt catalyst.

Redox reaction – H is oxidised from an oxidation state of 0 in H_2 to +1 in butane while carbon in but-1-ene changes from an oxidation state of -2 to an oxidation state of -2.5 in butane. Carbon is reduced.

c. Give the name of the type of reaction that is represented by:

- 2 addition

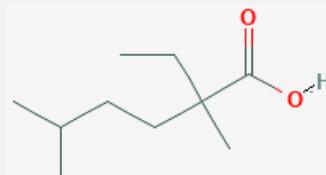
- 3 Oxidation

2) Consider the organic compound 2,5-dimethyl-2-ethylhexanoic acid. Give the condensed and skeletal formulae of this compound in the space provided below.

Condensed



Skeletal

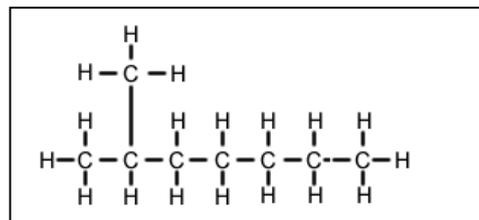


3) Consider the organic molecule with the semi-structural formula $(\text{CH}_3)_2\text{CH}(\text{CH}_2)_4\text{CH}_3$.

i. Give the IUPAC name for this molecule

2-methylheptane

ii. Draw its structural formula in the space provided.



4) 16.8 g of an alkene that contains two double bonds per molecule reacted completely with 64.0 g of bromine, Br_2 .

The molar mass of bromine, Br_2 , is 160 g mol^{-1} .

What is the formula mass of the alkene in g/mol ?

Since one Br_2 molecule will add to each double bond the mol ratio of Br_2 to alkene is 2:1.

Alkene + $2\text{Br}_2 \rightarrow$ tetrabromoalkane

Step 1 Find the mole of Br_2 that reacted

$$\Rightarrow 64.0 / 160 = 0.4 \text{ mol}$$

Step 2 Find the mol of alkene that reacted

$$\Rightarrow \frac{1}{2} \times 0.4 = 0.2 \text{ mol}$$

Step 3 Find the molar mass

$$\Rightarrow 16.8 / \text{Fm} = 0.2$$

$$\Rightarrow 16.8 / 0.2 = \text{Fm}$$

$$\Rightarrow 84.0 \text{ g/mol}$$