Knowledge check

Subject area: Organic chemistry | **Level: 14–16 years (Higher)**

Topic: Reactions of carboxylic acids | **Source: rsc.li/3o4cneK**

1. Below are some statements about carboxylic acids.

However, there are some mistakes.
Find as many as you can, then correct them.

a) A carboxylic acid contains the -OH functional group. ✗

Answer: *should be -COOH instead of -OH functional group.*

b) The names of carboxylic acids all end in -oic acid.

c) The first part of the name tells you how many hydrogen atoms are present in the molecule. ✗

Answer: *should be how many carbon atoms, not hydrogen atoms.*

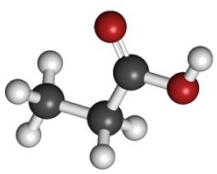
d) The letters -an- link the prefix to the -oic acid ending.

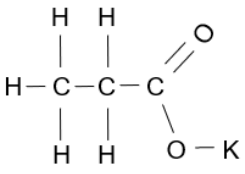
e)

Number of carbon atoms	Prefix
1	Meth-
2	Prop- ✗
3	Eth- ✗
4	But-

Answer: *Eth- and Prop- should be the other way around.*

f) The molecule below is called ethanoic acid. ✗



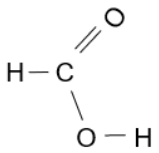


Answer: *the molecule is called propanoic acid.*

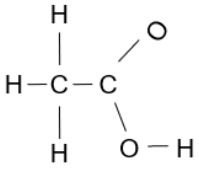
2. George is asked by his teacher to draw out the structure of ethanoic acid.

He gives four possible structures, but only one is correct.
Which one is correct?

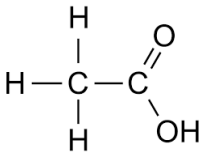
A



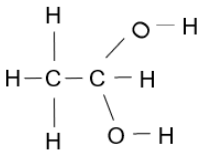
B



C



D



Answer: *molecule C.*

3. Alan and Michelle carry out some experiments using ethanoic acid, and test for any gases formed.

The chemical formulae of the substances added are in the left-hand boxes.
Their observations are on the right-hand side.
Draw straight lines to link the substance with the correct gas test.

Formula of substance being added	**Observation**
Mg	A gas forms that turns limewater milky
Na_2CO_3	No gas forms
NaOH	A gas that forms a squeaky pop with a lighted splint

4. This question is about the acidity of ethanoic acid solution.

Complete the spaces.

a) Carboxylic acids dissolve in water to produce a *weakly* **acidic solution.**

b) When they dissolve they partially or slightly *ionise/dissociate* **to produce** H^+ **ions.**

c) Universal indicator turns *yellow-orange* **when added to a solution of ethanoic acid.**

d) The pH of a solution of ethanoic acid is normally about *3–6*.

e) The equation to show ethanoic acid's reaction in water is:

$CH_3COOH \rightleftharpoons CH_3COO^- + H^+$