**AQA – Polymers – A2 Chemistry P2**

**1.** June/ 2019/Paper_2/No.3

**0 3** The outer layers of some golf balls are made from a polymer called polyisoprene.
The isoprene monomer is a non-cyclic branched hydrocarbon that contains 88.2 % carbon by mass.
The empirical formula of isoprene is the same as its molecular formula.

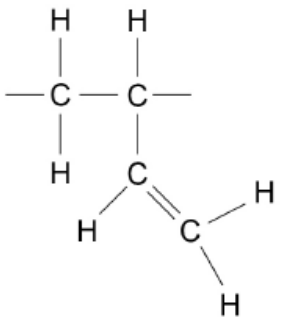
**0 3 . 1** Deduce the molecular formula of isoprene and suggest a possible structure.

**[4 marks]**

Molecular formula _____

Structure

**0 3 . 2** The insides of some golf balls are made from a mixture of three other polymers. The repeating unit for one of these polymers is shown.




Draw the skeletal formula of the monomer used to make this polymer.

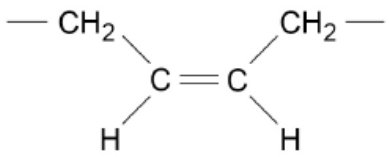
Give the IUPAC name of the monomer.

**[2 marks]**

Skeletal formula of monomer

IUPAC name _____

**0 3 . 3** A second polymer in the mixture has a repeating unit with the structure shown.




The third polymer in the mixture is a stereoisomer of this polymer.

Draw the structure of the repeating unit of the third polymer.

Give a reason why this type of stereoisomerism arises.

**[2 marks]**

Repeating unit

Reason _____

_____

_____

**0 3 . 4** Golf balls recovered from lakes and ponds can be used again even after being in water for several years.

Explain why these golf balls do not biodegrade.

**[1 mark]**

_____

_____

_____

**2.** June/2021/Paper_2/No.9

**0 9** This question is about the ozone layer in the upper atmosphere.

**0 9 . 1** State why the ozone layer is beneficial for living organisms.

**[1 mark]**

**0 9 . 2** State how chlorofluorocarbons (CFCs) form chlorine atoms in the upper atmosphere.

**[1 mark]**

**0 9 . 3** Give equations to show how chlorine atoms catalyse the decomposition of ozone.

**[2 marks]**

**0 9 . 4** Hydrochlorofluorocarbons (HCFCs) have been used in place of CFCs.
In the mechanism to make an HCFC from a fluoroalkane, two incomplete steps are shown.

Complete each step in the mechanism.

Give the name of the type of step shown by both these equations.

**[3 marks]**

_____ → $\bullet CHF_2$ + HCl

$\bullet CHF_2$ + $Cl_2$ → _____

Type of step _____