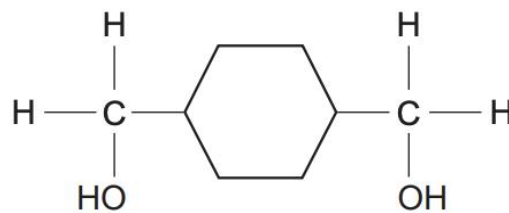


Question 30**(7 marks)**

Polycyclohexanedimethyl terephthalate glycol, (PCTG), is a strong, chemically-resistant polymer that is food-safe. The monomers needed to synthesise PCTG are terephthalic acid and 1,4-cyclohexanedimethanol, as shown below.



terephthalic acid

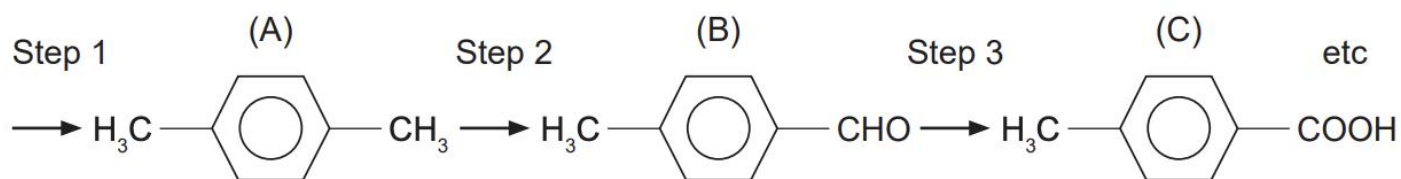


1,4-cyclohexanedimethanol

- (a) In the space below, draw the structural formula of PCTG, showing **two** repeating units. (2 marks)

- (b) State the name or give the formula of the by-product of this polymerisation process. (1 mark)

The following flow diagram shows some of the steps needed to synthesise terephthalic acid.



- (c) Name **two** reagents that could be used to synthesise (C) from (B) in Step 3. (2 marks)

One: _____

Two: _____

(d) Write a balanced half-equation to show (B) reacting to form (C).

(2 marks)

