

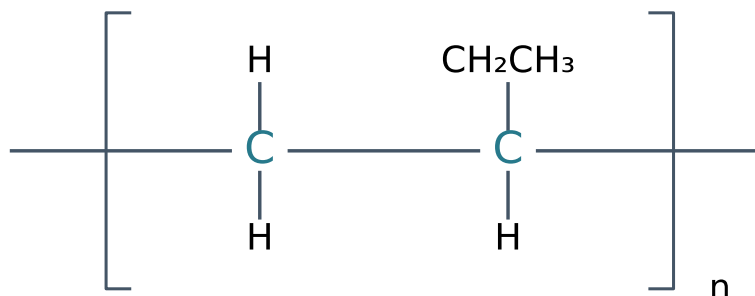
Solutions

2.1 C=C, a carbon-carbon double bond.

2.2 Poly(propene).

2.3 Water (usually).

3.1



C₄H₈ per repeat; continuation bonds cross both brackets

Two backbone carbons; correct H/ethyl side groups and valencies; brackets with continuation bonds and n.

3.2 Each diol molecule has two –OH groups and each acid two –COOH groups; ester links form between an –OH of one monomer and a –COOH of the other; releasing a molecule of water at each link; the alternating chain is a polyester with ester linkages.

3.3 DNA – two polymer chains made of four different nucleotides wound as a double helix; proteins from amino acids; starch and cellulose from glucose.

3.4

CH₂=CHCl: restore the double bond



Two C=C carbons; two H on one carbon and one H/one Cl on the other with valid bonds.
No water: all monomer atoms are retained by addition polymerisation.

3.5 Ten molecules joined in one open chain make nine links, hence nine water molecules. Two groups let each monomer join at both ends, so chain growth can continue rather than stopping at one isolated ester. The count assumes the stated open chain, not a ring.

3.6 Amino –NH₂ and carboxylic-acid –COOH groups. Five molecules make four links, hence lose four waters.

$$M_r(\text{chain}) = 5M_r(\text{glycine}) - 4M_r(\text{water})$$

$$M_r(\text{chain}) = 5 \times 75 - 4 \times 18 = 303$$

Correct mass subtraction; 303 with no mass unit because this is relative mass.