Solutions

Each answer shows the steps, then the **result**.

2.1

- the small part that is repeated again and again along the polymer chain

2.2

- non-biodegradable (microbes cannot break them down); combustion releases harmful/toxic gases

2.3

- poly(tetrafluoroethene), PTFE

2.4

- single **C–C** covalent bonds (the polymer is saturated)

3.1 B

- The monomer needs a C=C double bond

3.2 B

- Burning PVC releases toxic hydrogen chloride

3.3

(a)

- $-(CH_2CH(CH_3))_n-$ drawn with bonds out at each end

(b)

- chloroethene, $CH_2{=}CHCl$

3.4

- the C–C backbone is strong and unreactive, so microbes/enzymes cannot break it down, and it persists in the environment

3.5

(a)

- $CH_2{=}CHCN$ (propenenitrile)

(b)

- M_r of the monomer $= 3 \times 12 + 3 \times 1 + 14 = 53$
- number of units $= \dfrac{53\,000}{53} = \mathbf{1000}$

3.6

- all the atoms of the monomers end up in the polymer, and there is no other product

3.7

- any two of: recycling (melting and remoulding), incineration to release energy, cracking into useful smaller molecules (feedstock recycling)