(Polymers: addition and condensation polymers)

Q1.a)(2018)

property	J	K
density in g/cm^3		
melting point in °C		✓
flame resistance		✓
water absorption	✓	

Q1.b)(2018)

$$\frac{1.4 \times 6.0}{0.90}$$

$$= 9.3 \text{ (kg)}$$

Q1.c)(2018)

polymer **L** will not melt

Q1.d)(2018)

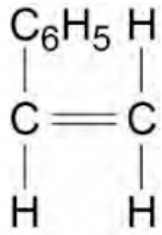
polymers are more hard-wearing

Q1.e)(2018)

any **two** from:

- (wool / sheep) renewable
- (wool) will not run out
- (crude oil) non-renewable
- (crude oil) will run out

Q2.(2018)



Q3.(2018)

polymerisation

Q4.(2018)

monomers

many

polymers

Q5.(2020)

polymers

propene

Q6.(2020)

covalent

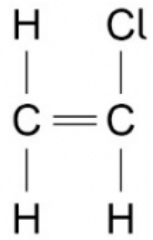
Q7.a)(2020)

thermosetting

Q7.b)(2020)

polymer **A** has crosslinks
(between polymer molecules)
or
polymer **B** has no crosslinks
(between polymer molecules)

Q8.(2021)



Q9.(2021)

propene

Q10.a)(2022)

C=C bond

2x C-H bonds **and** 2x C-CH_3 bonds

Q10.b)(2022)

any **one** from:

- (otherwise) the copper (produced) would be impure
- (otherwise) the copper (produced) would be a mixture
- (otherwise) the insulation would burn / melt (during recycling)
- copper and poly(butene) are recycled by different methods

Q10.c)(2022)

(wire heated until) copper melts

(re)cast / reformed (into pipes)

Q10.d)(2022)

any **two** from:
(recycling scrap copper)
- uses less energy
- conserves copper (ore)
- (produces) less waste
- specified environmental impact

Q10.e)(2022)

sodium hydroxide (solution)

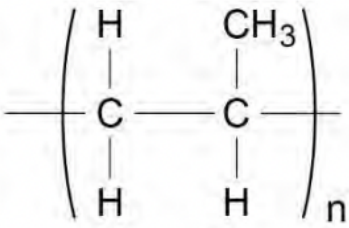
blue precipitate

Q10.f)(2022)

(add acidified) barium chloride (solution)

white precipitate

Q11.(2023)



Q12.(2023)

(**Stage 1** is) fractional distillation

(**Stage 2** is) cracking

(**Stage 3** is) polymerisation

Q13.(2023)

alkene

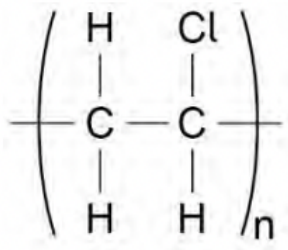
monomer

Q14.(2024)

cellulose

starch

Q15.(2024)



Q16.a)(2024)

1.5 × 10 0.9 × 10

(ratio =) 15 : 9

= 5 : 3

alternative approach

(ratio =)

$\frac{1.5}{0.9}$ $\frac{0.9}{0.9}$ (1)

1.666 : 1 (1)

= 5 **:** 3 (1)

Q16.b)(2024)

the pipes will melt
or
the polymers will melt

Q16.c)(2024)

oil is non-renewable
or
paper is obtained from a renewable source