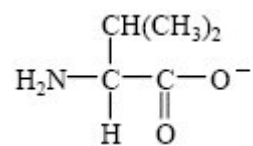
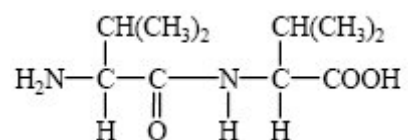


M1. (a) (i)



1

(ii)

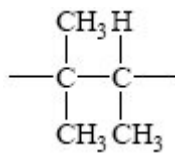


1

(iii) hydrogen bonding (do not allow H-bonding) QWC  
do not penalise any error twice.

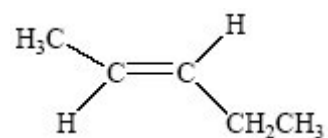
1

(b) (i)



1

(ii)

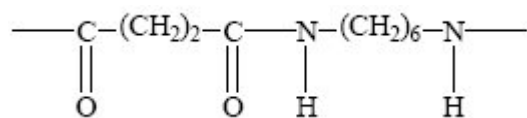


1

(iii) Isomer must be saturated or must not contain a double bond

1

(c)



2

(d) (i) heat/reflux with aq NaOH

1

poly(alkene) is inert/ no reaction

1

polyamide is hydrolysed (or undergoes hydrolysis)  
to form acid salt and alcohol QWC

1

(ii) e.g combustion

1

heat energy produced

1

toxic gases produced

1

[14]

**M2.(a)** 1, 4-diaminobutane or butane -1, 4-diamine (1)

A: BrCH<sub>2</sub>CH<sub>2</sub>Br or ClCH<sub>2</sub>CH<sub>2</sub>Cl (1)

B: NC CH<sub>2</sub>CH<sub>2</sub>CN

Step 1: Br<sub>2</sub> or Cl<sub>2</sub> (1) (ignore aq)

Step 2: KCN (1) (NOT HCN)

Step 3: H<sub>2</sub> / Ni or LiAlH<sub>4</sub> or Na / C<sub>2</sub>H<sub>5</sub>OH (1) (NOT NaBH<sub>4</sub>)

Hydrogenation only for H<sub>2</sub> / Ni, or nucleophilic addition only for LiAlH<sub>4</sub>(1)

*OR reduction or addition*

7

