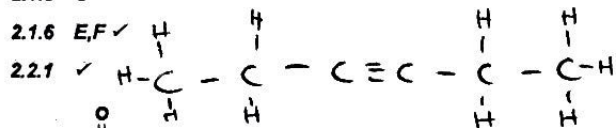
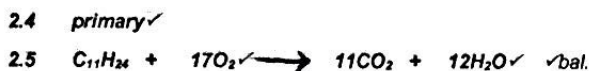


- 1.1 A ✓✓  
 1.2 B ✓✓  
 1.1 A ✓✓

- 2.1.1 E ✓  
 2.1.2 A ✓  
 2.1.3 A ✓  
 2.1.4 D ✓  
 2.1.5 C ✓

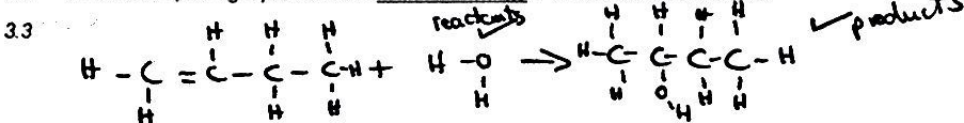


- 2.2.2
- 2.3 ✓ 2-methylpropan-1-ol ✓



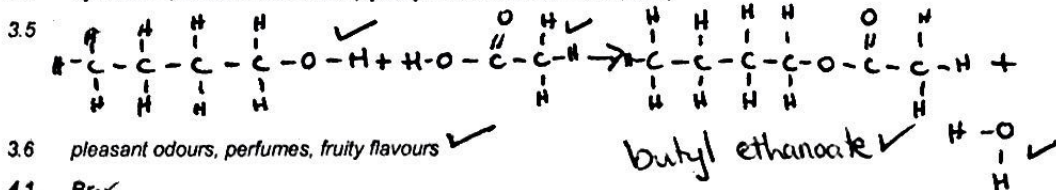
- 3.1 A substitution ✓ (halogenation)  
 B elimination (dehydrohalogenation) ✓  
 C addition (hydration) ✓  
 D substitution ✓  
 E esterification ✓

3.2 X=butane ✓, UV light provides the activation energy ✓ since alkanes unreactive



Markovnikov says that carbon with most Hydrogens ✓ will get more H ✓ (NOT "rich gets richer")

3.4 hydration ✓, addition with water (hydrolysis is substitution with water) ✓



3.6 pleasant odours, perfumes, fruity flavours ✓

- 4.1  $Br_2$  ✓
- 4.2 The alkane remains brown ✓ and the alkene changes the colour to colourless ✓ (no explanation needed)

5.1 alcohols ✓

- 5.2.1 the chain length is increasing ✓, causing more sites for Vd Waals bonds, increasing the IM forces.  
 More energy needed to break the IM bonds, higher temp needed to provide this higher temp. ✓
- 5.2.2 the molecules are polar, and water is polar ✓, the IM forces of water and these alcohols are of the same strength ✓
- 5.2.3 the alcohol molecules become more non polar ✓ and water is polar (like dissolves like) ✓
- 5.2.4 Ethane has weak London forces ✓ while ethanol has strong H-bonding and Vd Waals forces. More energy needed to overcome stronger forces in ethanol. ✓ Room temperature does not provide enough energy.

[3]



6.2 elimination ✓

7.1 ratio that N, P and K ✓ appears in the fertiliser

7.2 contributes to healthy fruit ✓ and seeds, anti-disease

7.3.1 Enable the production of large quantities of food at affordable prices (or any worthwhile answer) ✓

7.3.2 Eutrophication, Blue baby syndrome, etc ✓

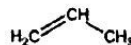
7.4 the mass of phosphorous in the bag is  $(\frac{1}{8} \times 0,34 \times 5) = 0,19$  kg ✓

- 8.1 International union of Pure and Applied Chemistry ✓ } not marked  
 8.2 Name giving system ✓

Marking rule:

Condensed or semi-structural formula / Gekondenseerde of semistruktuurformule: Max./Maks.  $\frac{2}{3}$

e.g./bv.



All bonds shown, one or more H atoms omitted / Alle bindinge getoon, een of meer H-atome uitgelaat.

Max./Maks.  $\frac{2}{3}$

Molecular formula / Molokulêre formule: Max./Maks.  $\frac{1}{3}$

Hyphen(s) omitted / Koppeltaken(s) uitgelaat: Max./Maks.  $\frac{2}{3}$

[12.2.3] (3)