

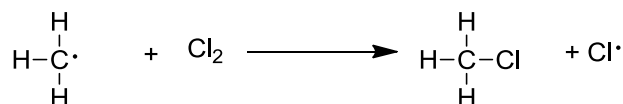
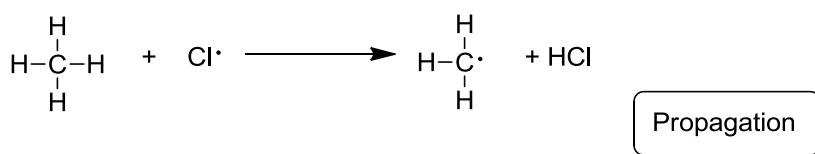
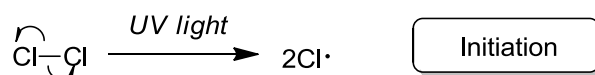


STARTER FOR 10...

5.2.6 Free radical mechanisms

Free radicals are formed from homolytic bond breaking, where a bond breaks and each atom gets one of the electrons. Alkanes react via a free radical substitution mechanism which has 3 stages, initiation, propagation and termination.

For methane initiation and propagation steps are as follows



- Using your knowledge of the free radicals in the mixture, predict the 3 possible termination steps. (3 marks)
- If chlorine is in excess then substitution of the product chloromethane can occur through a series of propagation steps. Show by a series of reactions how this can lead to the formation of the carcinogen tetrachloromethane (CCl_4). (6 marks)
- Predict a termination step that could lead to the formation of a product with the empirical formula CHCl_2 . (1 mark)

(b) Branched chain isomers have a lower bpt/straight chain alkanes have a higher bpt

(c) Straight chain alkanes have a higher surface contact (1 mark) therefore greater VdW forces (1 mark)

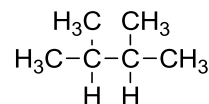
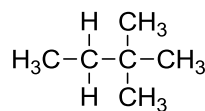
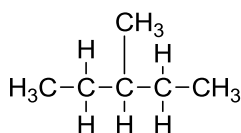
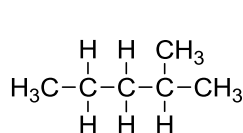
5.2.5

1. No C=C bonds

2. $C_n H_{2n+2}$

3. $C_8 H_{18}$

4. (a)



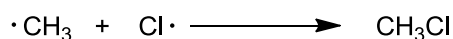
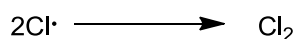
(b) $C_6H_{14} + 9.5O_2 \rightarrow 6CO_2 + 7H_2O$

(c) $C_6H_{14} + 6.5O_2 \rightarrow 6CO + 7H_2O$

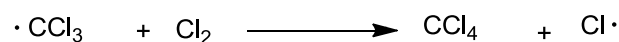
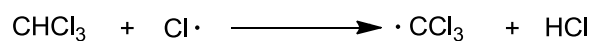
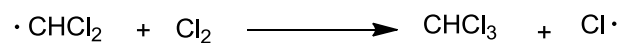
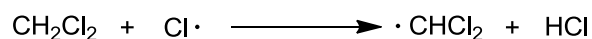
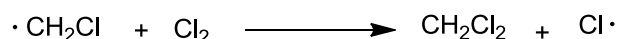
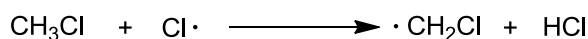
CO is poisonous/water vapour is a greenhouse gas

5.2.6

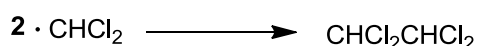
Question 1



Question 2 (Successive substitutions on the alkyl radical)



Question 3



5.2.7

1.

(a) O_3