



FREE RADICAL SUBSTITUTION

Ethane reacts with chlorine in the presence of uv light to form a mixture of halogenoalkanes.

1 Write an equation for the initiation step. $\text{Cl}_2 \rightarrow 2\text{Cl}\cdot$

2 What is the uv light for? **Provides energy to break the covalent bond in Cl_2**

3 Two of the products in this reaction are chloroethane and 1,1-dichloroethane.

a Write a balanced equation for the reaction of chlorine with ethane to form chloroethane.



b Write a balanced equation for the reaction of chlorine with ethane to form 1,1-dichloroethane.



4 One of the products from this reaction is chloroethane. Write a pair of propagation steps to form chloroethane from ethane.



5 One of the products from this reaction is 1,1-dichloroethane. Write a pair of propagation steps to form 1,1-dichloroethane from chloroethane.



6 What would be the product of the reaction of ethane with a large excess of chlorine in the presence of uv light?



7 Some 1,2-dichloroethane can be formed in a termination step. Write an equation to show how this can happen.

