

e.g. $\text{CH}_4 \rightarrow \text{CH}_3\text{Cl}$	(1) $\text{CH}_4 + \text{Cl}\bullet \rightarrow \bullet\text{CH}_3 + \text{HCl}$ (2) $\bullet\text{CH}_3 + \text{Cl}_2 \rightarrow \text{CH}_3\text{Cl} + \text{Cl}\bullet$
e.g. $\text{CHBr}_2\text{-CH}_3 \rightarrow \text{CBr}_3\text{-CH}_3$	(1) $\text{CHBr}_2\text{-CH}_3 + \text{Br}\bullet \rightarrow \bullet\text{CBr}_2\text{-CH}_3 + \text{HBr}$ (2) $\bullet\text{CBr}_2\text{-CH}_3 + \text{Br}_2 \rightarrow \text{CBr}_3\text{-CH}_3 + \text{Br}\bullet$
e.g. $\text{CH}_3\text{Cl} \rightarrow \text{CH}_2\text{Cl}_2$	(1) $\text{CH}_3\text{Cl} + \text{Cl}\bullet \rightarrow \bullet\text{CH}_2\text{Cl} + \text{HCl}$ (2) $\bullet\text{CH}_2\text{Cl} + \text{Cl}_2 \rightarrow \text{CH}_2\text{Cl}_2 + \text{Cl}\bullet$
e.g. $\text{CHCl}_3 \rightarrow \text{CCl}_4$	(1) $\text{CHCl}_3 + \text{Cl}\bullet \rightarrow \bullet\text{CCl}_3 + \text{HCl}$ (2) $\bullet\text{CCl}_3 + \text{Cl}_2 \rightarrow \text{CCl}_4 + \text{Cl}\bullet$
e.g. $\text{CHF}_2\text{-CH}_3 \rightarrow \text{CF}_3\text{-CH}_3$	(1) $\text{CHF}_2\text{-CH}_3 + \text{F}\bullet \rightarrow \bullet\text{CF}_2\text{-CH}_3 + \text{HF}$ (2) $\bullet\text{CF}_2\text{-CH}_3 + \text{F}_2 \rightarrow \text{CF}_3\text{-CH}_3 + \text{F}\bullet$
e.g. $\text{CHF}_2\text{-CH}_3 \rightarrow \text{CHF}_2\text{-CH}_2\text{F}$	(1) $\text{CHF}_2\text{-CH}_3 + \text{F}\bullet \rightarrow \text{CHF}_2\text{-}\overset{\bullet}{\text{C}}\text{H}_2 + \text{HF}$ (2) $\text{CHF}_2\text{-}\overset{\bullet}{\text{C}}\text{H}_2 + \text{F}_2 \rightarrow \text{CHF}_2\text{-CH}_2\text{F} + \text{F}\bullet$
e.g. $\text{CH}_3\text{-CH}_2\text{-CF}_3 \rightarrow \text{CH}_3\text{-CHBr-CF}_3$	(1) $\text{CH}_3\text{-CH}_2\text{-CF}_3 + \text{Br}\bullet \rightarrow \text{CH}_3\text{-}\overset{\bullet}{\text{C}}\text{H-CF}_3 + \text{HBr}$ (2) $\text{CH}_3\text{-}\overset{\bullet}{\text{C}}\text{H-CF}_3 + \text{Br}_2 \rightarrow \text{CH}_3\text{-CHBr-CF}_3 + \text{Br}\bullet$

TERMINATION	(2 radicals \rightarrow molecule) If two free radicals collide, they will form a molecule and stop the chain reaction. Any two free radicals involved in the mechanism could collide in this way.
Write an equation to show how each of the molecules shown could be formed by a termination step in the reactions shown.	
e.g. $\text{CH}_3\text{-CH}_3$ in $\text{CH}_4 \rightarrow \text{CH}_3\text{Cl}$	$2 \bullet\text{CH}_3 \rightarrow \text{CH}_3\text{-CH}_3$
e.g. $\text{CCl}_3\text{-CCl}_3$ in $\text{CH}_4 \rightarrow \text{CCl}_4$	$2 \bullet\text{CCl}_3 \rightarrow \text{CCl}_3\text{-CCl}_3$
e.g. $\text{CH}_2\text{Cl-CCl}_3$ in $\text{CH}_4 \rightarrow \text{CCl}_4$	$\bullet\text{CH}_2\text{Cl} + \bullet\text{CCl}_3 \rightarrow \text{CH}_2\text{Cl-CCl}_3$
e.g. $\text{CF}_3\text{-CH}_2\text{F}$ in $\text{CH}_4 \rightarrow \text{CF}_4$	$\bullet\text{CF}_3 + \bullet\text{CH}_2\text{F} \rightarrow \text{CF}_3\text{-CH}_2\text{F}$
e.g. butane in $\text{CH}_3\text{-CH}_3 \rightarrow \text{CH}_3\text{-CH}_2\text{F}$	$2 \bullet\text{CH}_2\text{-CH}_3 \rightarrow \text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_3$
e.g. $\text{CBr}_3\text{-CBr}_3$ in $\text{CH}_4 \rightarrow \text{CBr}_4$	$2 \bullet\text{CBr}_3 \rightarrow \text{CBr}_3\text{-CBr}_3$
e.g. 1,3-dibromobutane in $\text{CH}_3\text{-CH}_3 \rightarrow \text{CBr}_3\text{-CBr}_3$	$\bullet\text{CH}_2\text{-CH}_2\text{Br} + \bullet\text{CHBr-CH}_3 \rightarrow \text{CH}_2\text{Br-CH}_2\text{-CHBr-CH}_3$