



# Organic Chemistry Revision Sheets

## Halogenoalkanes | Nucleophilic Substitution ( $S_N1$ )

### Reaction

**REACTANTS:** Halogenoalkane and Nucleophile

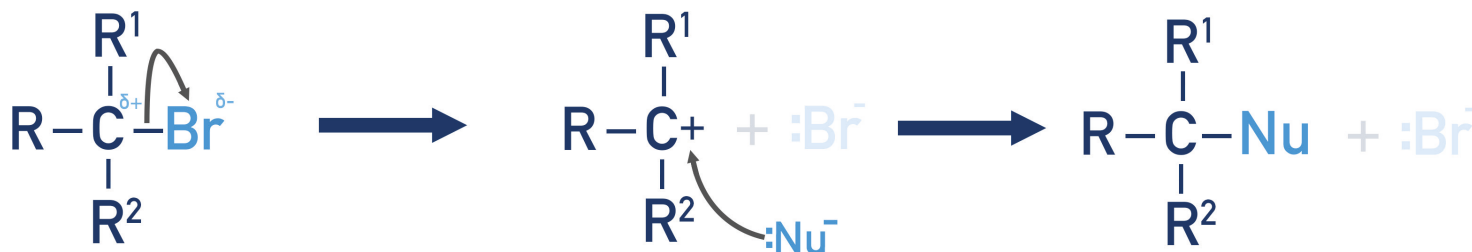
**REACTION TYPE:** Nucleophilic Substitution,  $S_N1$

**REACTION:**  
(example of  
2-bromo-2-meth-  
ylpropane)



### Mechanism

The first step of the  $S_N1$  mechanism is the breaking of the carbon-halogen bond in the halogenoalkane, forming a carbocation. The nucleophile is then able to form a bond with the carbocation.



### Notes:

- The  $S_N1$  reaction occurs (usually) with tertiary halogenoalkanes and only slightly with secondary halogenoalkanes. This is because the carbon-halogen bond is too 'crowded' by alkyl groups for the nucleophile to attack the partially positive carbon directly.
- $S_N1$  reaction is **slower** than  $S_N2$  reaction.
- $S_N2$  reaction occurs mainly with primary halogenoalkanes (and, to a lesser extent, secondary halogenoalkanes).