



# Organic Chemistry Revision Sheets

## Halogenoalkanes | Nucleophilic Substitution ( $S_N2$ )

### Reaction

**REACTANTS:** Halogenoalkane and Nucleophile

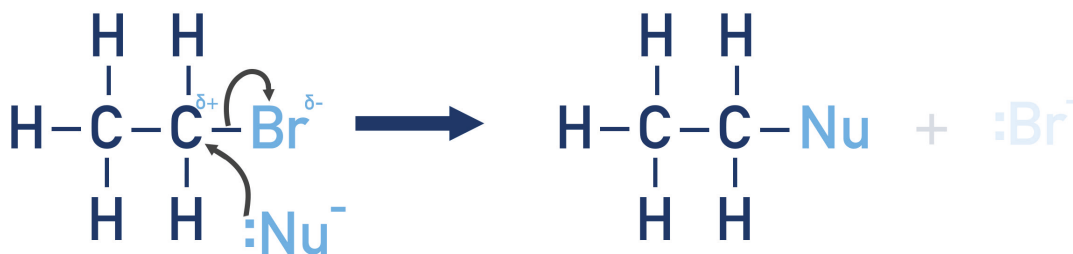
**REACTION TYPE:** Nucleophilic Substitution,  $S_N2$

**REACTION:**  
(example of  
bromoethane)



### Mechanism

**$S_N2$  reaction mechanisms have only one step.** The nucleophile attacks the carbon-halogen bond directly, forming a new carbon-nucleophile bond as the carbon-halogen bond breaks.



### Notes:

- The  **$S_N2$  reaction occurs (usually) with primary halogenoalkanes** and only slightly with secondary halogenoalkanes. This is because the carbon-halogen bond in the primary halogenoalkane is more available for the nucleophile to attack than the partially positive carbon directly.
- $S_N2$  reaction is **faster** than  $S_N1$  reaction.
- $S_N1$  reaction occurs mainly with tertiary halogenoalkanes (and, to a lesser extent, secondary halogenoalkanes).