**Substitution nucleophilic reaction review**

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|  | **SN1** | **SN2** |
| **Class of halogenoalkane**  | **tertiary (and secondary)** | **primary (and secondary)** |
| **Number of steps**  | **two** | **one** |
| **Molecularity**  | **unimolecular**  | **bimolecular**  |
| **Example rate expression**  | **rate = k[(CH3)3CBr]** | **rate = k[CH3CH2Br][OH-]** |
| **Transition state or intermediate**  | **carbocation intermediate**  | **unstable transition state**  |
| **Type of bond fission**  | **heterolytic**  | **heterolytic**  |
| **Type of attack**  | **frontside attack** | **backside attack**  |
| **Change in stereochemistry**  | **50/50 mix of enantiomers (racemic mixture -optically inactive)** | **inversion of configuration (optically active)** |
| **Type of solvent**  | **polar protic**  | **polar aprotic**  |
| **Relative rate of reaction (fastest to slowest)**  | **tertiary > secondary > primary**  | **primary > secondary > tertiary**  |
| **Example mechanism** |  |  |