**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** |  |  |