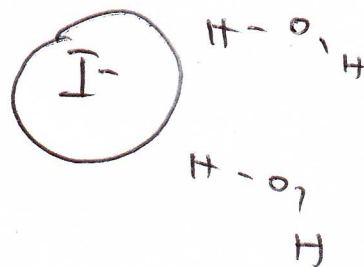
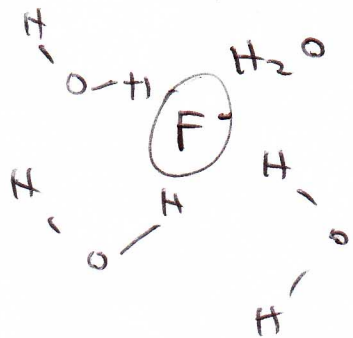
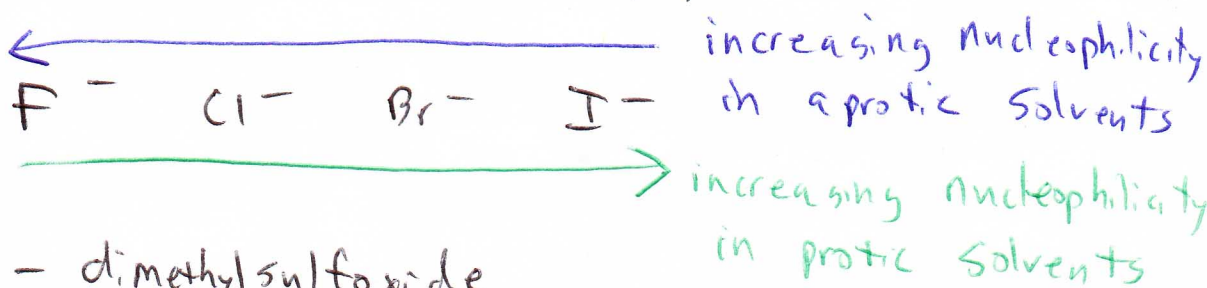


Polar Aprotic solvents for S_N2

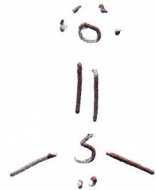
Aprotic - having no "easily" removable protons (non-acidic) → those hydrogens that are present are unlikely to undergo hydrogen bonding



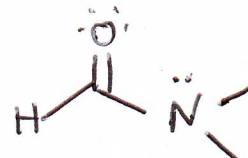
solvent cage - solvation sphere - small, compact ions like fluorine can easily be surrounded by protic solvents, which can interfere with fluorine being able to attack a substrate in an S_N2 rxn.



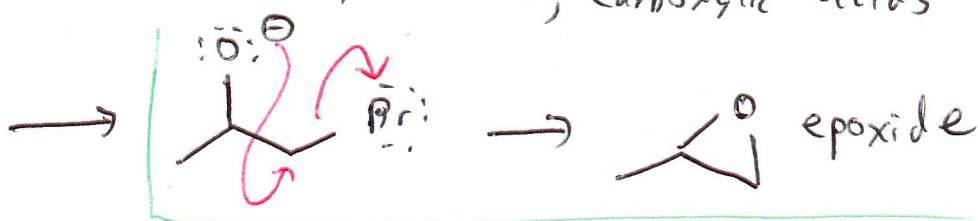
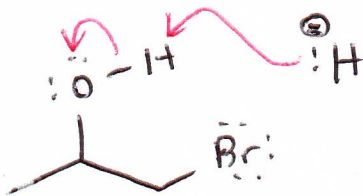
DMSO - dimethylsulfoxide



DMF - dimethylformamide

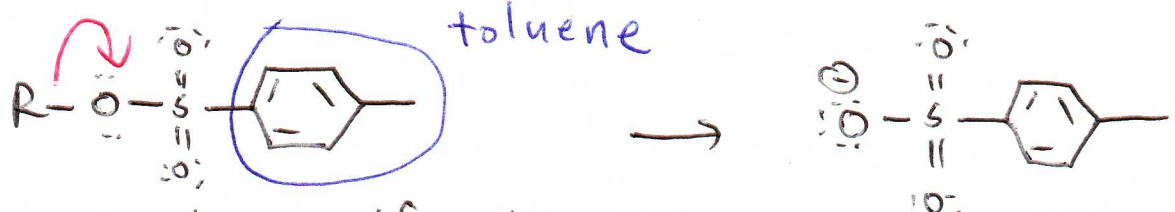


poor solvents for S_N2: water, alcohols, carboxylic acids

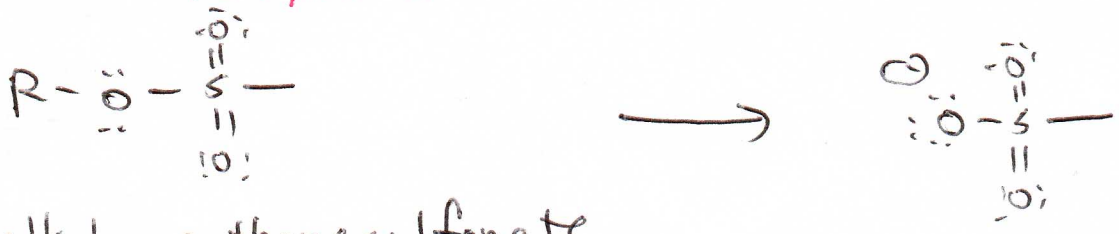


intramolecular S_N2

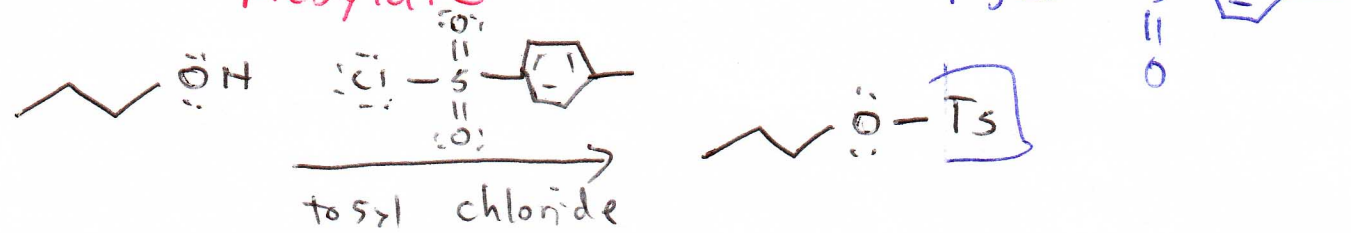
SN1



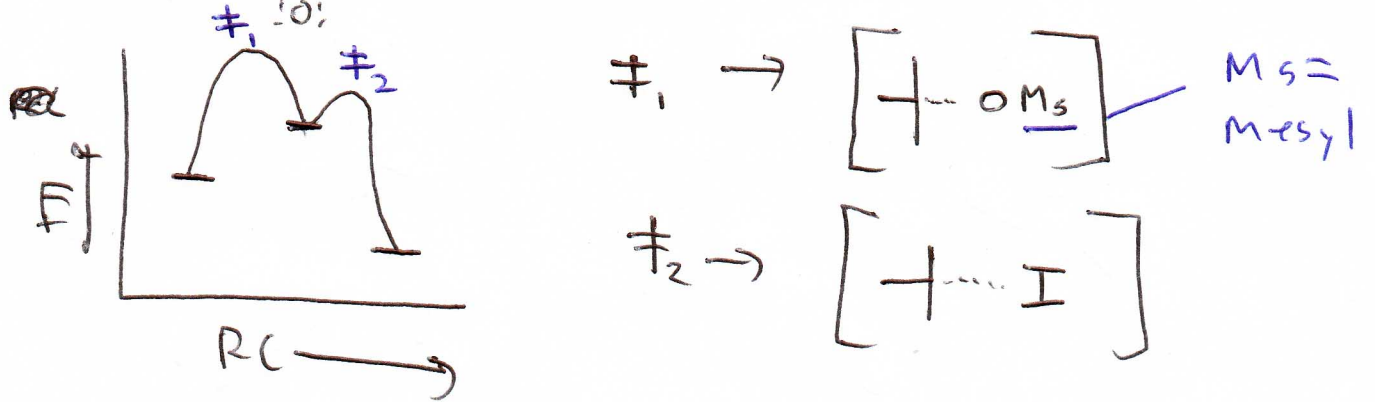
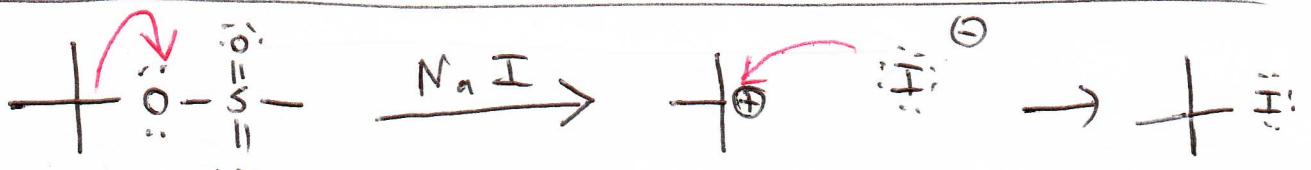
alkyl p-toluenesulfonate
tosylate



alkyl methanesulfonate
mesylate



- | | | | |
|------------------|-----------------|------------------|--------------------|
| <chem>CCO</chem> | <chem>CO</chem> | <chem>CCO</chem> | <chem>CCCCO</chem> |
| EtOH | MeOH | PrOH | BuOH |

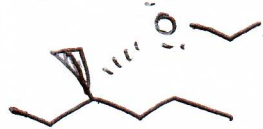
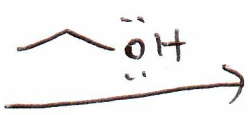


- 1 utility \rightarrow alkyl halide \rightarrow alcohol, ether
- 2 reagents \rightarrow weak, non-basic nucleophile
- 3 conditions \rightarrow protic solvents
- 4 mechanism
- 5 stereochemistry \rightarrow loss of configuration
- 6 regiochemistry \rightarrow ~~hydride shifts~~ carbocation rearrangement



sp², planar

Since the geometry of the carbocation (the important intermediate) is planar, attack of the nucleophile can occur from either side, producing two products,

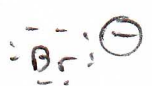


+

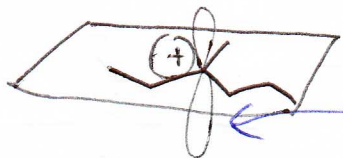


If both products form in equal proportions, the mixture will be optically inactive, (racemic).

However, after dissociation, ions can sometimes form ion pairs in sol'n. When this occurs, one side of the carbocation would be somewhat blocked,



which would result in a mixture with two products, but not in exactly equal proportion,



Attack slightly more likely from below