

NUCLEOPHILICITY (NUCLEOPHILES & ELECTROPHILES)

def. nucleophile. a chemical species that **DONATES** an electron pair to an electrophile to form a chemical bond.

All Lewis bases are nucleophiles.

donate "electron" = "accept proton."

Fluoride anion (F^-) is a nucleophile.

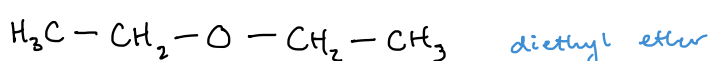
* Stronger vs. Weaker Nucleophile?

differs based on type of solvent

A. Protic Solvent [e.g. water]

* Has hydrogens that may be bonded to, or free H^+

B. Aprotic Solvent [e.g. di-ethyl ether]

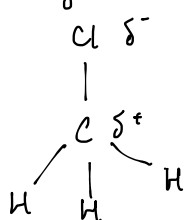


6.7 Nucleophiles & Electrophiles

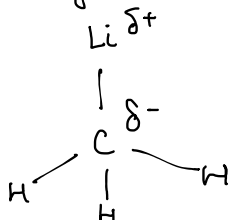
def. ionic reactions, also called polar rxns, involve participation of ions as reactants, intermediates, or products.

* IR occur when one rxn has site of high ED, and other rxn has site of low ED.

Methyl Chloride



Methyl Lithium



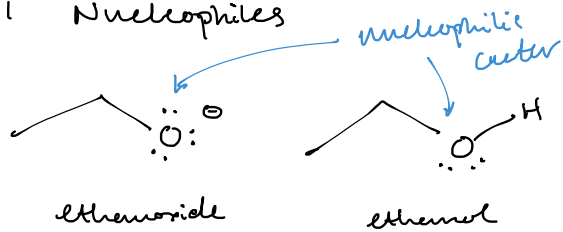
def. nucleophile. an electron rich center. (therefore wants to bond to nuclei + charge).

characterized by ability to rx w/ (+) or (δ^+).

def. electrophile. an electron-deficient center

essence of organic is to study & predict e^- density flow in rxn.

6.7.1 Nucleophiles



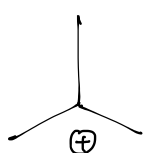
* any chem. species w/ lone pair can be a nucleophile.

* Strength of NP is affected by polarizability.

def. polarizability. how unevenly can charges be spread in resp. to outside influence.

* π -bond also creates region of high ED.

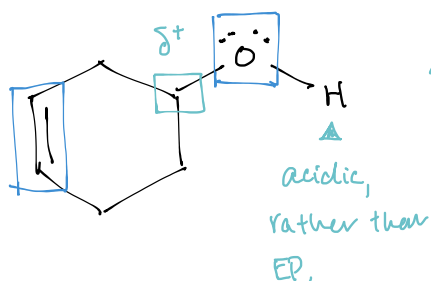
6.7.2 Electrophiles



Carbocation

$sp^2 + p$ *can accept e^- here*

* inductive effects (δ^+) or,
* empty p-orbital



non EP \downarrow ED
non NP \uparrow ED