Recall:
The lower the pKa the more acidic the compound

Examples of strong acids:

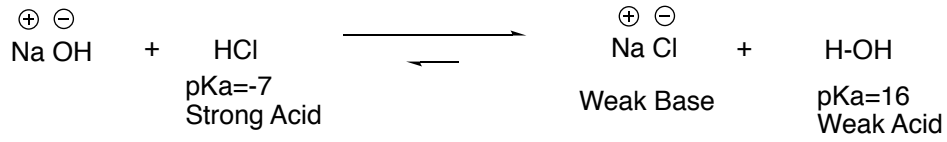
Acid	pKa
HI	-10
HBr	-9
HCl	-7
HF	-10
H_3O^+	-1.74

→ Can go up to +3.17 in a diluted sol'n (in water)

Two factors that affect acidity of the above acids:

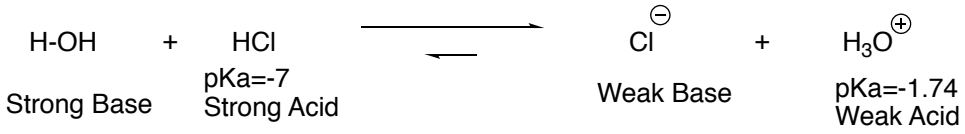
1) Electronegativity – the more electronegative the atom, the better it can hold a negative charge
2) Solvation – the larger the ion, the better solvated it can be and so the more acidic it's conjugate acid will be

Ex #1)



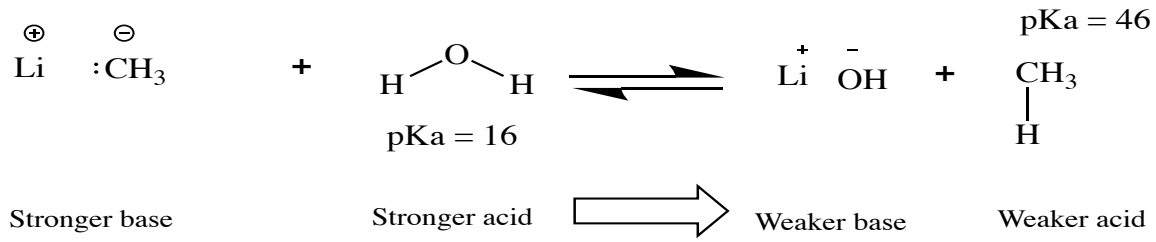
A strong acid and a strong base will quickly react with each other to drive the reaction to the weak acid and the weak base.

Ex #2)

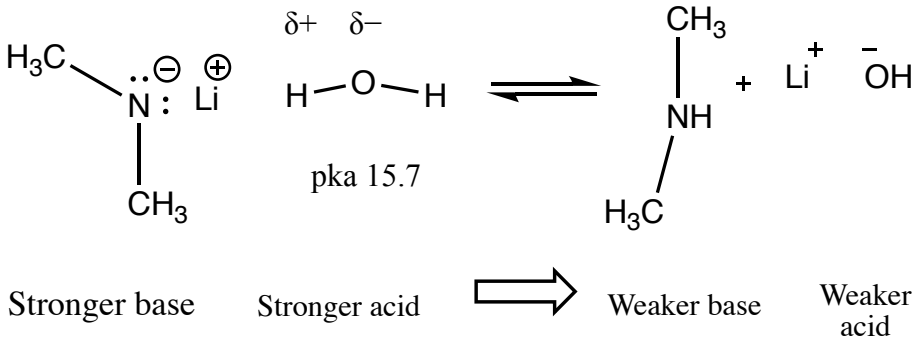


While water is not actually a strong base, it is in comparison to C^-. HCl is the strong acid, and so the equilibrium lies to the right. Hence H_3O^+ is the strongest acid that will exist in an aqueous solution of HCl.

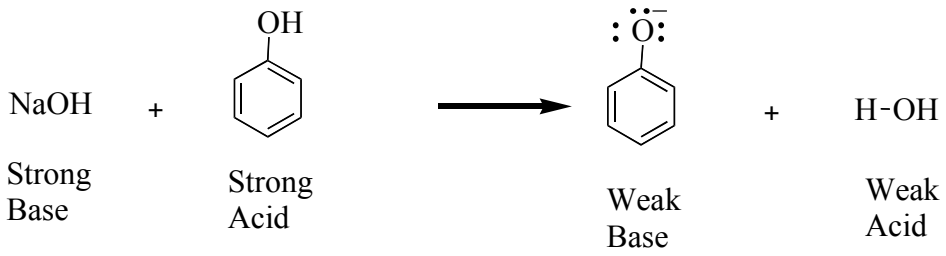
Ex #3)


Li
:CH3
+
H
O
H
pKa = 16
Li
OH
+
pKa = 46
CH3
H
Stronger base
Stronger acid
Weaker base
Weaker acid

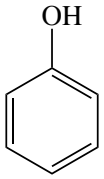
Ex #4)


H3C
N
Li
CH3
δ+ δ–
H
O
H
pka 15.7
CH3
NH
H3C
+
Li
OH
Stronger base
Stronger acid
Weaker base
Weaker acid

Ex #5)



NB: Oxygen is more electron withdrawing than Carbon and can stabilize negative charge so removing a proton from the oxygen is preferable than from the Carbon on the phenol compound



Phenol

Phenol pKa = 10