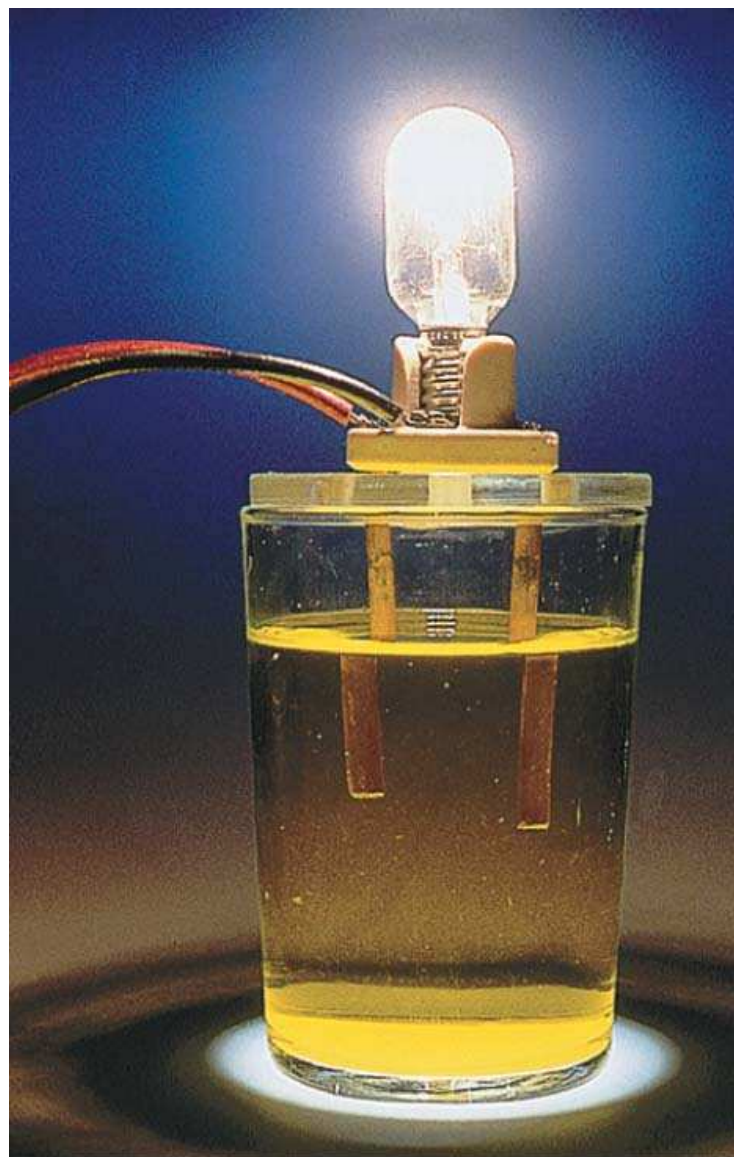


Acid Base Theory

Solution Conductivity



Formation of ions

When dissolved into water the following break up into ions:

ionic compounds that are soluble in water

NaCl is a soluble ionic compound

strong acids

HNO₃ is a strong acid

Acid Base Theory

Arrhenius definition based on ionization

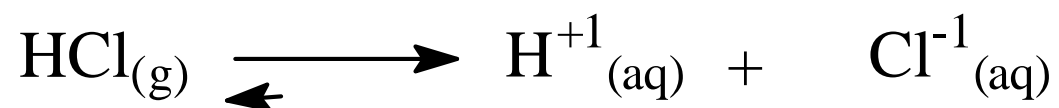
acid- any substance that, when dissolved into water,
ionizes and forms H^{+1} ions

base- a metal hydroxide
produces OH^{-1} ions in solution

Acid Strength

strong acids ionize completely and are strong electrolytes

1000 molecules



weak acids only partially ionize and are weak electrolytes

1000 molecules

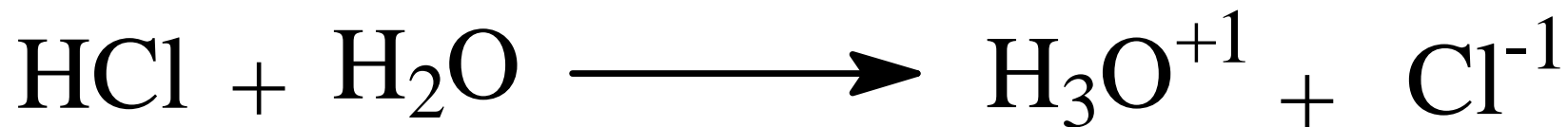


Strong Acids

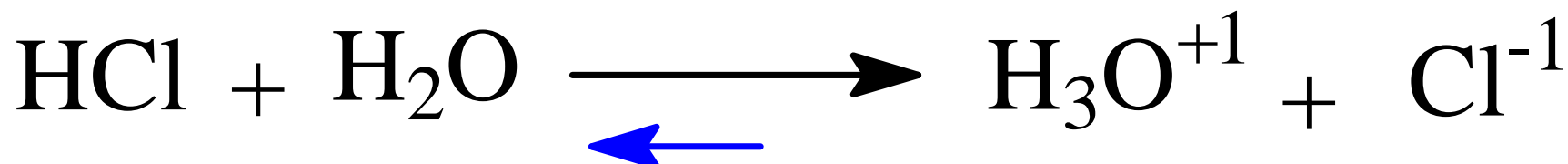
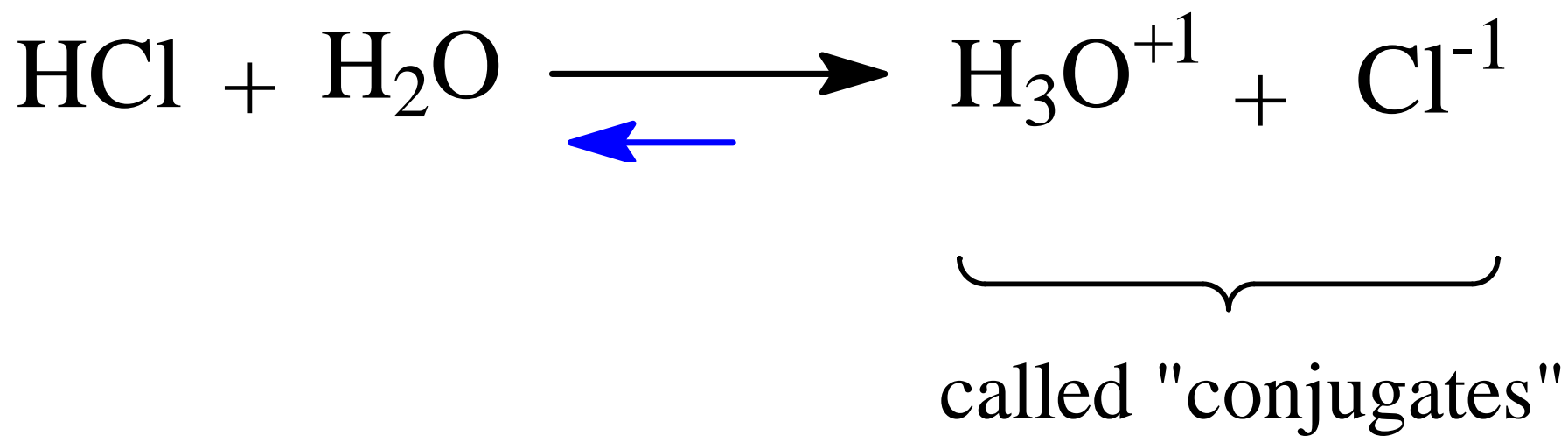
Bronsted Lowry Definition

acid- H^{+1} donor

base- H^{+1} acceptor

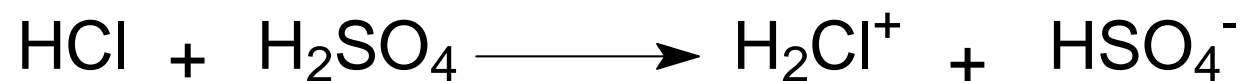
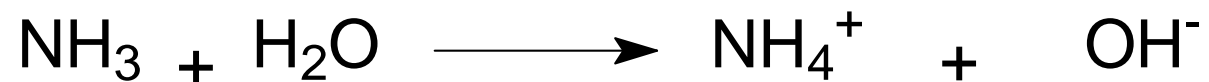


Reactions are Reversible



Q1

Label the acid, base, conjugate acid and conjugate base



Q2

- Based on the previous equations, rank
- HCl, H₂O, NH₃ and H₂SO₄ in order of increasing base strength

Notice

acid $\xrightarrow{\text{becomes}}$ conjugate base

base $\xrightarrow{\text{becomes}}$ conjugate acid

$\text{HCl}/\text{Cl}^{-1}$ are "conjugate pairs"

$\text{H}_2\text{O}/\text{H}_3\text{O}^{+1}$ are "conjugate pairs"

Another Point of View

What's the conjugate base of H_2O ?

Since an acid becomes a conjugate base,
treat H_2O as an acid (remove H^{+1})

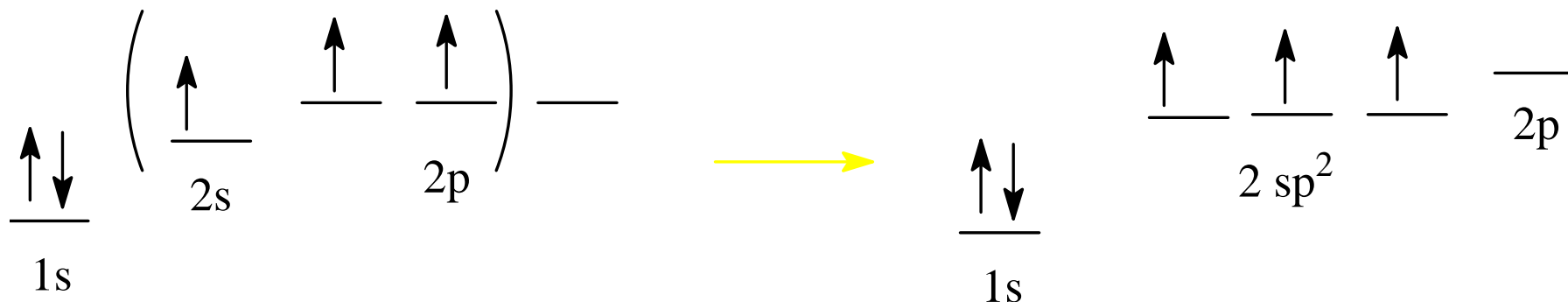
Q3

- What is the conjugate acid of HNO_3 ?
- What is the conjugate base of OH^{-1} ?

Lewis Acids and Bases

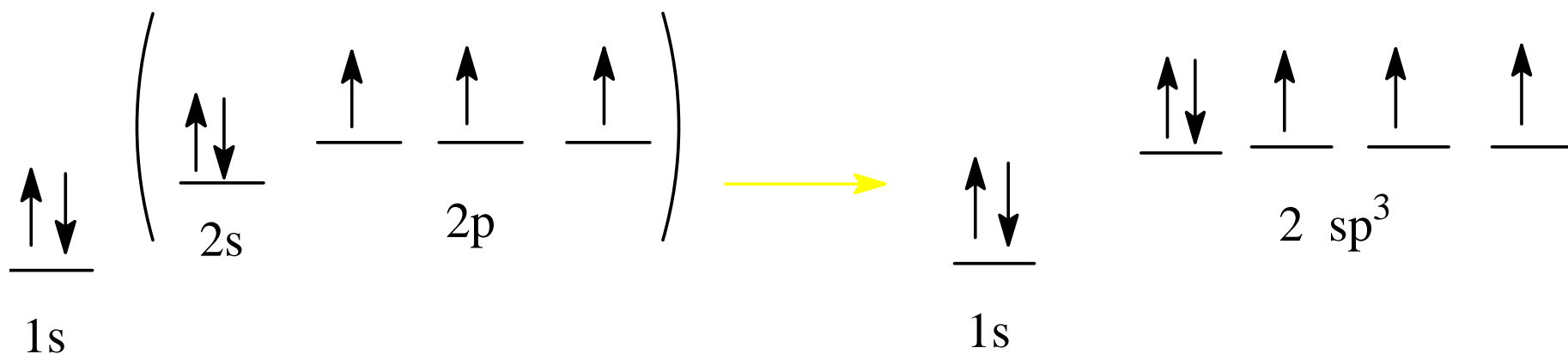
A Lewis acid is an electron pair acceptor

(look for electron deficient atoms -6 valence electrons-
and an empty orbital for the electron pair)



Lewis Bases

A Lewis base is an electron pair donor and must have a lone pair to donate!



A Lewis Acid-Base Reaction

