Conjugate Acid Base Pairs

Name- Class-

An **acid** is defined as a proton (H^+) donor while a **base** is a proton acceptor. The substance that is produced after an acid has donated its proton is called the **conjugate base** while the substance formed when a base accepts a proton is called the **conjugate acid**. The conjugate acid can donate a proton to the conjugate base, to reform the original reactants in the reverse reaction.

Acids donate protons
Bases accept protons

A proton is a hydrogen ion

$$\underset{\textbf{acid}}{HF} + \underset{\textbf{base}}{H_2O} \leftrightharpoons \underset{\textbf{c. acid}}{H_3O^+} + \underset{\textbf{c. base}}{F^-}$$

In the reaction above HF is the acid and H_2O is the base. The HF has given a proton to the H_2O, forming H_3O^+ and F^-. Since the product H_3O^+ can donate a proton back to F^- it is labeled the conjugate acid, while the F^- is the conjugate base.

Example

Write an equation that shows NH_3 reacting with HCl. Label the acid, base, and conjugate acid and conjugate base.

- Write reactants and transfer a proton from the acid to the base:

$$\underset{\textbf{base}}{NH_3} + \underset{\textbf{acid}}{HCl} \overset{H^+}{\leftrightharpoons} \underset{\textbf{c. acid}}{NH_4^+} + \underset{\textbf{c. base}}{Cl^-}$$

For each equation. Identify the acid, the base, the conjugate acid, and the conjugate base in each of the equations.

1. $HCl + NH_3 \rightarrow NH_4^+ + Cl^-$

2. $HCO_3^- + HCl \rightarrow H_2CO_3 + Cl^-$

Q2. Fill in the following table.

Acid	Base	Conjugate Acid	Conjugate Base	Equation
HNO_2	H_2O			$HNO_2 + H_2O \rightarrow NO_2^- + H_3O^+$
H_2O	F^-	HF	OH^-	
				$NH_3 + HCN \rightarrow NH_4^+ + CN^-$
		H_2O	ClO_3^-	

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