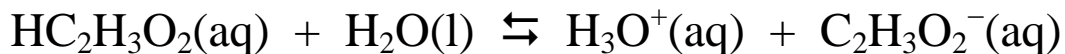


Ch 17 • Acids & Bases**STATION 1 — CONJUGATE ACIDS & BASES**

Identify the conjugate acid-base pairs in the following equation:



The conjugate acid of SO_4^{2-} is _____

The conjugate base of HCO_3^- is _____

The conjugate acid of NH_3 is _____

Which substance(s) are amphiprotic / amphoteric? H_2O OH^- NH_3 HCO_3^- SO_4^{2-}

Ch 17 • Acids & Bases**STATION 2 — pH OF ACID SOLUTIONS**

Calculate the pH of a 0.150 M solution of HCl. ($K_a = \text{very large}$)

Calculate the pH of a 0.150 M solution of HF. ($K_a = 7.2 \times 10^{-4}$)

What is the % dissociation of HF in a 0.150 M solution?

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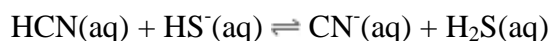
STATION 3 — EQUILIBRIA

The following equation is written to represent relative concentrations in solution:



Which species is the stronger acid: $\text{HC}_2\text{H}_3\text{O}_2$ or H_3O^+

Knowing that H_2S is a stronger acid than HCN , re-write the following equilibrium to show which species are more concentrated in solution.



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STATION 4 — pH & pOH

$[\text{H}^+]$	$[\text{OH}^-]$	pH	pOH	acidic or basic?
		3.25		
2.5×10^{-2}				
	7.1×10^{-5}			

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STATION 5—ICE BOX

A 0.0300 M solution of the weak acid, HA, has a pH of 4.25.

- Write the dissociation equation for this weak acid.
- Calculate the $[H^+]$ for a 0.0300 M solution of this weak acid.
- Calculate the K_a of this weak acid.

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STATION 6—LEWIS & BRONSTED-LOWRY DEFINITIONS

Consider the reaction: $F^- + H_2O \rightleftharpoons HF + OH^-$

F⁻ would be a (circle all answers that apply):

Brønsted-Lowry acid

Brønsted-Lowry base

Lewis acid

Lewis base

Consider the reaction: $BF_3 + NH_3 \rightarrow BF_3NH_3$

BF₃ would be a (circle all answers that apply):

Brønsted-Lowry acid

Brønsted-Lowry base

Lewis acid

Lewis base

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STATION 7—DIPROTIC ACIDS

Consider the diprotic acid, sulfurous acid: H_2SO_3

$$K_{a1} = 1.2 \times 10^{-2}$$

$$K_{a2} = 6.6 \times 10^{-8}$$

a. Write the equations for the step-wise dissociation of sulfurous acid.

b. Calculate the pH of a 0.0200 M solution of H_2SO_3 .

c. What is the $[\text{SO}_3^{2-}]$ in a 0.0125 M solution of H_2SO_3 ?

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STATION 8—SALT SOLUTIONS

For each solution, state whether it would be Acidic, Basic, or Neutral.

___ NH_4Cl

___ Na_2SO_4

___ $\text{KC}_2\text{H}_3\text{O}_2$

___ CaF_2

___ MgSO_3

___ KI

HCN is a weak acid with a $K_a = 6.2 \times 10^{-10}$.

a. Write the equation for the equilibrium that exists in a solution of KCN .

b. Calculate the K_b for CN^- .

c. Calculate the pH of a 0.0200 M solution of KCN .

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STATION 9—WEAK BASES

NH_3 is a weak base with a $K_b = 1.8 \times 10^{-5}$.

- Write the dissociation equation for NH_3 in water.
- Calculate the pH of a 0.100 M solution of NH_3 .
- Calculate the K_a for the conjugate acid of NH_3 .
- Write the equation for the equilibrium that exists in a solution of NH_4Cl .

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- Calculate the pH of a 0.100 M solution of NH_3 .
- Calculate the K_a for the conjugate acid of NH_3 .
- Write the equation for the equilibrium that exists in a solution of NH_4Cl .