

Chemistry 30

Unit 5: Acids & Bases**29 max****Assignment 1: An Introduction to Acids & Bases**

1. What is the difference between a strong electrolyte and a weak electrolyte? For your answer you should define these terms and explain what makes an electrolytic solution strong or weak.

Strong electrolytes conduct electricity well, due to the relatively high concentration of ions in solution. Strong electrolytes, therefore, dissociate completely or nearly so.

2

Weak electrolytes conduct electricity poorly or not at all due to the low concentration of ions in solution. Weak electrolytes either dissolve poorly in water, or do not dissociate into ions upon dissolving (e.g. most molecular compounds)

(This answer is slightly more complete than required – key points: how well electricity is conducted and how this relates to ion concentrations)

2. Classify each of the following as either an acid or a base:

a. The substance has a bitter taste

Base

b. H_2SO_4

Acid

c. HNO_3

Acid

d. litmus paper dipped in this turns red

Acid

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e. reacts with active metals to produce hydrogen gas

Acid

f. KOH

Base

g. NH_3

Base

h. has a slippery feel

Base

i. has a sour taste

Acid

j. a proton donor

Acid

k. a proton acceptor

Base

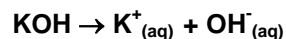
3. Define amphoteric.

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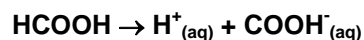
A substance that can act as either an acid or a base. Also known as amphiprotic.

4. Write balanced equations for each of the following:

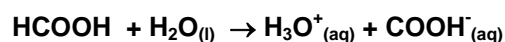
a. The dissociation of potassium hydroxide, KOH



3 b. The ionization of formic acid, HCOOH without including water as a reactant



c. The ionization of formic acid, HCOOH, showing the formation of the hydronium ion



5. For each of the following bases, write the formula for its conjugate acid; for each acid write the formula of the conjugate base.

	Base	Conjugate Acid	Acid	Conjugate Base
7 a.	I^-	<u>HI</u>	<u>HClO_4</u>	<u>ClO_4^-</u>
b.	SO_3^{2-}	<u>HSO_3^-</u>	<u>H_2S</u>	<u>HS^-</u>
c.	PO_4^{3-}	<u>HPO_4^{2-}</u>	<u>HCO_3^-</u>	<u>CO_3^{2-}</u>
d.	$\text{C}_2\text{H}_3\text{O}_2^-$	<u>$\text{HC}_2\text{H}_3\text{O}_2$</u>		

6. For each of the following reactions, identify the Brønsted-Lowry acid and Brønsted-Lowry base on the reactant side of the equation, and the conjugate acid and conjugate base on the product side.

4 a.	$\text{NH}_4^+(\text{aq})$	+	$\text{CN}^-(\text{aq})$	\rightarrow	$\text{HCN}(\text{aq})$		$\text{NH}_3(\text{aq})$
	<u>Acid</u>		<u>Base</u>		<u>Conjugate Acid</u>		<u>Conjugate Base</u>
b.	$(\text{CH}_3)_3\text{N}(\text{aq})$	+	$\text{H}_2\text{O}(\text{l})$	\rightarrow	$(\text{CH}_3)_3\text{NH}^+(\text{aq})$	+	$\text{OH}^-(\text{aq})$
	<u>Base</u>		<u>Acid</u>		<u>Conjugate Acid</u>		<u>Conjugate Base</u>

7. Predict the products of the following acid-base reaction

