

Name: _____

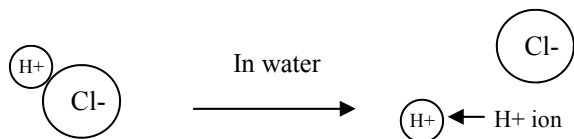
Period: _____

Ch. 25:1

Acids and Bases

Acids

Acids are compounds that add H^+ ions to water when in a solution.

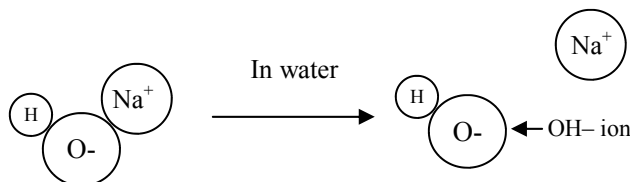


HCl—
Hydrochloric acid:
a very strong acid.

In water it breaks up
(dissociates) and
adds H^+ ions.

Bases

Bases are compounds that add OH^- ions to water when in a solution.



NaOH—
sodium hydroxide:
a very strong base.

In water it breaks up
(dissociates) adding
 OH^- ions to the water.



Many of our foods are acidic: citric (lemons; oranges); apples; tomato sauce.

Acids taste **sour** and feel “**squeaky**” when you rub your fingers together.

Many of our cleaning products are basic: ammonia (Windex); soap; bleach.

Bases taste **bitter** and feel **slippery**.

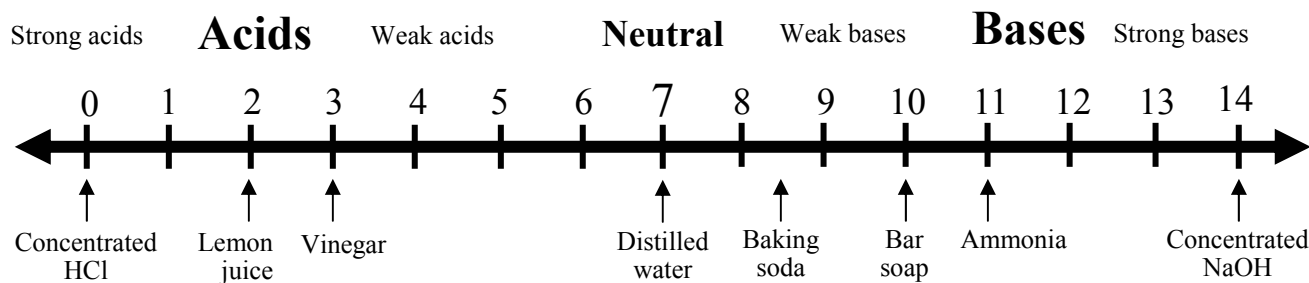


Strong acids and bases—ionize almost completely in water, contributing many ions.

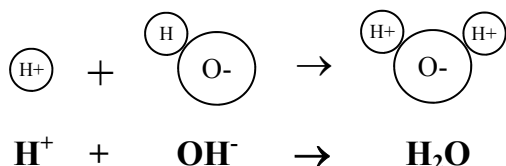
Strong acids and bases can burn your skin or eyes.

Weak acids and bases—ionize incompletely, contributing just a few ions.

pH—Measure of Acids and Bases

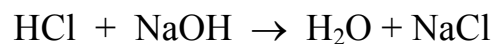


Neutralization (Titration)



When acids and bases are mixed they neutralize each other. If an equal concentration of acid and base are mixed they make neutral salt water.

Typical neutralization reaction



“Neutralize that stomach acid” with an antacid—a base! Antacids are just bases.

Name: _____

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pH and Acid Rain

Ch. 25:1

Plants and animals need water close to neutral (pH 7) to survive.

Due to pollution from combustion reactions, rain today can be acidic. Rain less than pH 5.6 we call **acid rain**.

Acid rain can kill plants, cause asthma and other physical problems.



Acid rain also eats away statues and historical landmarks.

The Roman ruins, the pyramids of Egypt, and other treasures of the world are being slowly dissolved away by acid rain. More damage has been done in the last century than in the last 2,000 years.

Without stopping pollution (and acid rain) these treasures may be lost forever.

1. Acid	A. To mix acids and bases to cancel each other out and make salt water.	1. pH	A. The measure of acids and bases.
2. Base	B. A compound that adds H ⁺ ions to water.	2. Salt Water	B. A compound that adds a few OH ⁻ ions to water.
3. Neutral	C. Equal number of H ⁺ and OH ⁻ ions; water is an example.	3. Strong Acid	C. The product of a neutralization reaction between an acid and a base.
4. Neutralize	D. A compound that adds OH ⁻ ions to water.	4. Weak Base	D. A compound that adds a few H ⁺ ions to water.
5. Acid Rain	E. When pollution causes rain to be acidic (pH of less than 5.6).	5. Weak Acid	E. A compound that adds a lot of H ⁺ ions to water.
Circle the <u>acids</u> and underline the <u>bases</u> .		<i>Solution A (pH 4); Solution B (pH 2)</i>	
HCl	H ₂ (CO ₃)	H ₃ PO ₄	Which one has more H ⁺ ions?
H ₂ (SO ₄)	NaOH	LiOH	Which one has less OH ⁻ ions?
Mg(OH) ₂	Ca(OH) ₂	HNO ₃	
Acids or Bases? (below)		<i>Solution A (pH 11); Solution B (pH 13)</i>	
Has fewer OH ⁻ ions:	pH of 1 to 7:	Which one has more OH ⁻ ions?	
Has more H ⁺ ions:	pH of 7 to 14:	Which one has less H ⁺ ions?	
Has fewer H ⁺ ions:	Feels slippery:	Finish this neutralization reaction: (balance the salt, too).	
Has more OH ⁻ ions:	Tastes sour:	HBr + Mg(OH) →	
Circle the ones that are "Soluble".		Circle the ones that are soluble in water.	
Saturated	Nonpolar molecules	CaO	K ₂ O Al ₂ O ₃
Insoluble	Dissolves in water	CO ₂	NaF CO
Polar molecules	Doesn't dissolve in water	What type of compounds are soluble?	
Classify these nuclear reactions as alpha α or beta β decay:		You have 400 kg of a radioactive substance with a short half-life of 1,000 years. How much will be left after these times:	
${}_{84}^{218}\text{Po} \rightarrow {}_{82}^{214}\text{Pb} \qquad {}_{83}^{210}\text{Bi} \rightarrow {}_{84}^{210}\text{Po}$		<u>1,000 years</u> <u>2,000 years</u> <u>4,000 years</u>	