Naming and Writing Formulas for Acids and Bases

Reminder:

Acids are aqueous hydrogen compounds that turn blue litmus red.

Bases are aqueous solutions of ionic hydroxides that turn red litmus blue.

IDENTIFYING ACIDS AND BASES FROM FORMULA'S

Most acid can be identified from **starting with H** or ending in COOH.

i.e. HCl, H_2SO_4, CH_3COOH

Note: NH_3 and CH_4 are not acids!

ionic

Most bases can be identified from ending in -OH

Bases are named using the rules for naming ionic compounds.

Ex. NaOH **sodium hydroxide**

Na^+ OH^-

CH_3OH

~~CH_3^+ OH^-~~

When naming acids, common names (for common acids) or IUPAC names can be used.

Classical Acid Names
- used the suffix **-ic** Ex. sulfuric
- used hydro and the suffix **-ic** Ex. hydrochloric
- used suffix **-ous** Ex. sulfurous
- and others (see inside back cover)

IUPAC (modern) Acid Names
- name the acid as an aqueous hydrogen compound

Ex. aqueous hydrogen sulfide - $H_2S_{(aq)}$

Ionic

$CaCl_2$

$Ca^{2+}\ Cl^-$

Molecular

CO_2

Acids

HCl, CH_3COOH

$H^+\ Cl^-$

Bases

$NaOH$

$Na^+\ OH^-$

Rules for Naming Acids

1. If anion ends in -ide, the acid is "hydro chlor ic acid"

Ex. HCl

$H^+ Cl^-$

aqueous hydrogen chloride

hydrochloric acid

2. If anion ends in -ate, the acid is "sulfur ic acid"

Ex. H_2SO_4

$H^+ SO_4^{2-}$
H^+

aqueous hydrogen sulfate

sulfuric acid

3. If anion ends in -ite, the acid is "sulfur ous acid"

Ex. H_2SO_3

$H^+ SO_3^{2-}$
H^+

aqueous hydrogen sulfite

sulfurous acid

HCN aqueous hydrogen cyanide

$H^+ CN^-$ hydrocyanic acid

H_3PO_4

H^+
H^+ PO_4^{3-}
H^+

aqueous hydrogen phosphate

phosphoric acid

HNO_2 aqueous hydrogen nitrite

$H^+ NO_2^-$ nitrous acid

CH_3COOH

CH_3COO^- H^+

-ate

carbonic acid

H^+ CO_3^{2-}

H^+

H_2CO_3

	Litmus Test	Solution Conductivity
Ionic	no change	✓
Molecular	no change	✗
Acids	blue → red	✓
Bases	red → blue	✓

CH_3COOH, NaCl, NaOH, CO_2

	Litmus Test	Solution Conductivity
A	—	✗
B	r → b	✓
C	b → r	✓
D	—	✓

m

b

a

i

p. 271-273

EXERCISE # 26-33