Warm-UP:

Acids and Bases

Although there is some disagreement on the exact definition of an acid or a base, there are some general qualities that help define them. An acid is a) a substance that can be a proton donor, b) a substance that can act as an electron acceptor, and c) a substance that produces hydronium ions (H_3O^{1+}) when dissolved in water. On the other hand, a base is a) a substance that can be a proton acceptor, b) a substance that can act as an electron donor, and c) a substance that produces hydroxyl ions (OH^{1-}) when dissolved in water.

Identify each of the following as an acid or a base.

a. H_2SO_4 Acid
b. NaOH Base
c. HCl Acid
d. $HClO_4$ Acid
e. KOH Base
f. $Ca(OH)_2$ Base

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- Acids: Donates hydrogen ions
  - ↳ $[H^+]$ Universal Symbol for Acidity
    - ↳ brackets = Concentration = Molarity
- Bases: donate hydroxide ions → accept H^+ ions
  - ↳ $[OH^-]$ = universal symbol for basicity
- Strong vs. Weak:

- Strong: completely ionized in solution

$HCl \xrightarrow{H_2O} H^+ + Cl^-$

$NaOH \xrightarrow{H_2O} Na^+ + OH^-$

- Weak: only slightly ionizes in solutio

$H_3BO_3 \underset{\longleftarrow}{\xrightarrow{H_2O}} H_2BO_3^- + H^+$
Boric acid

$NH_3 \underset{\longleftarrow}{\xrightarrow{H_2O}} NH_4^+ + OH^-$
Ammonia