

Acids and Bases: Chapter 19

I. Defining Acids and Bases

Property	Acids	Bases
Taste		
Touch		
pH ()		
Litmus paper turns...		
Chemical formula		
What they do with H ⁺		
Electrical Conductivity		
When they react with metals		

A. The Bronsted-Lowry Definition (Shake and Take!)

1. Acid –
2. Base –
3. Determine this by finding out what the substance needs to do to become what it is on the other side.



B. Water is

1. Amphoteric –
2. Example: $\text{HCl} + \text{H}_2\text{O} \rightarrow \text{H}_3\text{O}^+ + \text{Cl}^-$
3. Example: $\text{NH}_3 + \text{H}_2\text{O} \rightarrow \text{NH}_4^+ + \text{OH}^-$

C.

1. A _____ that
2. Conjugate acids and bases are
3. An acid _____ and it
Example: $\text{HCl} \rightarrow \text{H}^+ + \text{Cl}^-$
4. A base _____ and it
Example: $\text{NH}_3 + \text{H}^+ \rightarrow \text{NH}_4^+$
5. Example: Determine the acid-base pairs. $\text{NH}_3 + \text{HCl} \rightarrow \text{NH}_4^+ + \text{Cl}^-$

II. Strengths of Acids and Bases

A. Acid and base strength:

B. _____ Acids and Bases

1. Will _____ (_____) or
 - a. _____ : $\text{HCl} + \text{H}_2\text{O} \rightarrow \text{H}_3\text{O}^+ + \text{Cl}^-$
 - b. Examples: HCl, HBr, HNO₃, H₂SO₄, NaOH, LiOH, KOH, Ca(OH)₂
 - c. _____

C. _____ acids and bases.

1. Will _____
 - a. _____ : $\text{CH}_3\text{COOH} + \text{H}_2\text{O} \leftrightarrow \text{H}_3\text{O}^+ + \text{CH}_3\text{COO}^-$
 - b. Examples: HC₂H₃O₂ (vinegar), NH₃ (ammonia)
 - c. _____

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D. Acid/base strength is measured by

1. pH is
2. It is (based on the)
 - a. The
 - b. The
3. More on this later...

E. Trends

1. The
2. The

F.

1. When mixed, acids and bases (meaning that).
2. Mixing a strong acid and base

G. Reactions of acids and bases (products are ALWAYS H₂O and a salt)

1. Strong acid with strong base:
2. Strong acid with weak base:
3. Weak acid with strong base:
4. Weak acid with weak base:

III. Acid Base Application

A. Titrations

1. A method used to experimentally
 - a. by
 - b. phenolphthalein is usually used (for acids/bases)
 - c. signals that
2. Equivalence point: where the
3. Equation: where and
 - a. A is for acid and B is for base.
 - b. When calculating, make sure that the (L or mL)
 - c. NOTE: , therefore:
 - i.
 - ii.
 - iii.

d. Example: When 42.5 mL of a 1.03 M solution of NaOH is added to 50.0mL of vinegar (acetic acid, CH₃COOH), the phenolphthalein turns pink. What is the concentration of the acetic acid in vinegar?

B. Buffer: solution that when acids and bases are added

1. How to make a buffer
 - a. Mix a:
 - i.
 - ii.
 - b. (reaction)
2. How does it work?

a. consider a buffer composed of sodium acetate, NaC₂H₃O₂, (dissociating into C₂H₃O₂⁻) and acetic acid, HC₂H₃O₂

- i.
- ii.