

# Lesson 14

Chemistry 0

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## Week 14 HW Review

1. How does adding a catalyst speed up a reaction?
  - A. It heats it up
  - B. It increases the concentration of the reactants
  - C. It provides an alternative pathway for the reaction with a lower activation energy
  - D. All of the above
  
2. A catalyst is \_\_\_\_\_.
  - A. a substance that speeds up a reaction
  - B. a substance that is not consumed in a chemical reaction
  - C. a substance sometimes called an enzyme
  - D. All of the above



## Week 14 HW Review

3. What type of reaction occurs in a hand warmer?
  - A. Endothermic
  - B. Exothermic
  
4. If a chemical reaction is EXOTHERMIC, the temperature would \_\_\_\_\_.
  - A. Increase
  - B. Decrease
  - C. Stay the same



## Week 14 HW Review

5. A student mixed two chemicals to allow them to react. The temperature before the reaction was  $25^{\circ}\text{C}$ . The temperature after the reaction was  $18^{\circ}\text{C}$ . Which of the following is true?
- A. It is an endothermic reaction
  - B. It is an exothermic reaction
6. When ammonium nitrate is added to water, an endothermic reaction occurs and \_\_\_\_\_.
- A. nothing changes
  - B. the temperature of the reaction mixture falls
  - C. the temperature of the reaction mixture increases
  - D. Heat is given out



## Week 14 HW Review

7. In an exothermic reaction, \_\_\_\_\_.
- A. energy is absorbed from the surroundings and the temperature increases
  - B. energy is released to the surroundings and the temperature of the surroundings increases
  - C. energy is absorbed from the surroundings and the temperature of the surroundings decreases
  - D. energy is released to the surroundings and the temperature of the surroundings decreases



## Week 14 HW Review

8. In an endothermic reaction, \_\_\_\_\_.
- A. energy is absorbed from the surroundings and the temperature increases
  - B. energy is released to the surroundings and the temperature of the surroundings increases
  - C. energy is absorbed from the surroundings and the temperature of the surroundings decreases
  - D. energy is released to the surroundings and the temperature of the surroundings decreases

# Acids and Bases

- General properties

<b>Acids</b>	<b>Bases</b>
Sour in taste	Bitter in taste
Not slippery to the touch	Slippery to the touch
Dissolve metals	React with metals to form precipitates
Vinegar, tomatoes, black coffee	Detergents and many cleaners

# Acid-Base Theory

- Swedish Chemist Svante Arrhenius Theory

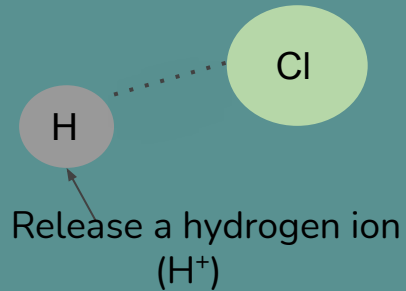
## Arrhenius Acid



(acid)

Example

Hydrogen Chloride (HCl)



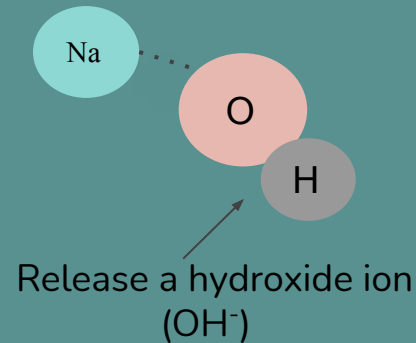
## Arrhenius Base



(base)

Example

Sodium Hydroxide (NaOH)







# Distinguishing Acids from Bases

- Litmus Paper
  - Blue litmus paper will turn red in the presence of an acid.
  - Red litmus paper will turn blue in the presence of a base.



# Distinguishing Acids from Bases

- pH scale

pH is a measure of the concentration of hydrogen ions in a solution.

pH=7: The solution is neither an acid nor a base- neutral

pH<7: The solution is an acid

pH>7: The solution is a base.



# Distinguishing Acids from Bases

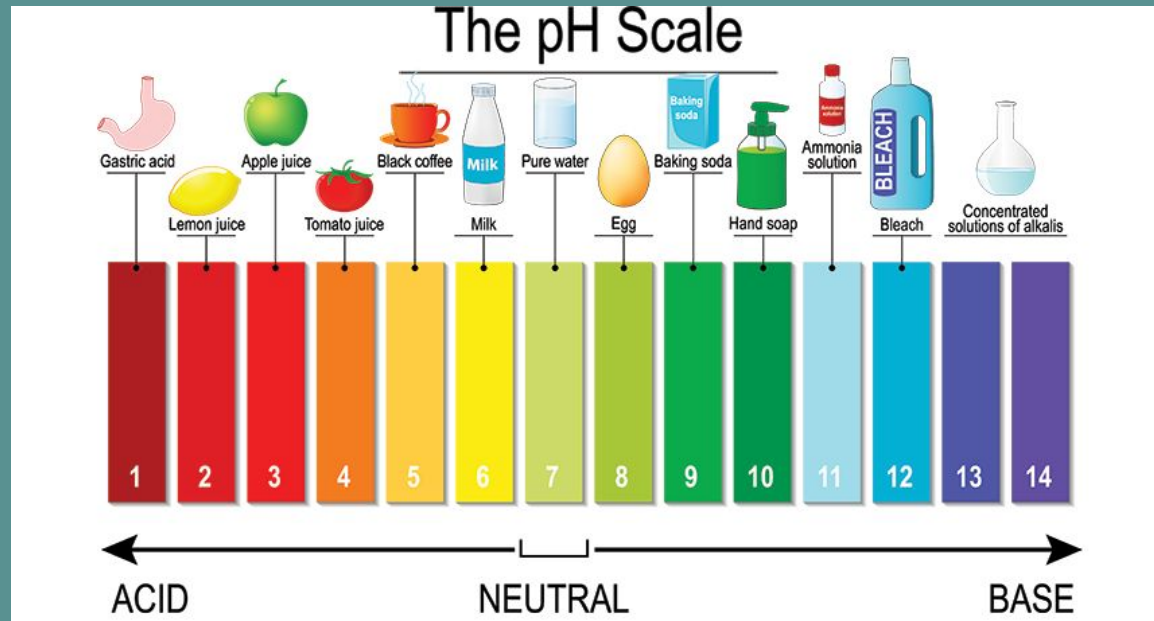
- pH

Take a guess of the pH of each item below:

- Lemon juice
- Apple juice
- Tomato juice
- Water
- Milk
- Egg
- Hand soap
- Bleach

# Distinguishing Acids from Bases

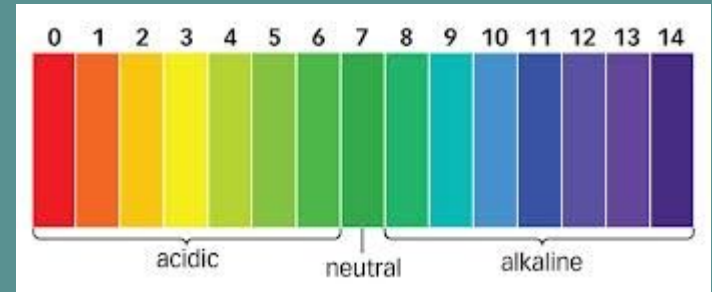
- The pH Scale



# Distinguishing Acids from Bases

- pH Indicators
  - Universal Indicators

The universal indicator is a liquid pH indicator which changes the color of a substance that it is put into according to the pH of the substance.



<http://acidsandbaseskate.weebly.com/indicators.html>

# Distinguishing Acids from Bases

- pH Indicators
  - pH Paper

pH paper are small strips of filter paper that are soaked with indicators that change color according to pH.



# Distinguishing Acids from Bases

- pH Meters





## Summary

- Acids are generally sour in taste, not slippery to the touch and dissolve metals.
- Bases are generally bitter in taste, slippery to the touch, and form precipitates with metals.
- Indicators such as litmus paper can be used to determine if a solution is an acid or a base.
- The pH of a solution measures the concentration of hydrogen ions.
- pH can be measured by pH paper, pH meters, and acid-base indicators.