45.1 Acids and Bases

Chemistry

Summarize main points from each video.

Video Title / topic _____

Video Title / topic _____

Video Title / topic _____

Topic Introduction

Summarize your understanding of each paragraph.

Acids were first recognized as substances that taste sour. Vinegar is sour because it is a dilute solution of acetic acid. Citric acid is responsible for the sour taste of a lemon.

We can determine what is going on in a solution by measuring its ability to conduct an electric current.

There is a concept students should learn during this topic. Specifically, the expression “conjugate” – as in conjugate base. There is an important relationship between the strength of an acid and that of its conjugate base.

A strong acid contains a relatively weak conjugate base. (A weak conjugate base is one that has a low attraction for protons). Generally, such a conjugate base is weaker than water in the competition for attracting H^+ ions.

Adapted from multiple sources.

Read/Summarize Text

1. **Read the passage.**
2. **Underline key expressions in each sentence.**
3. **Re-write each word (or expression) you underlined.**
4. **Summarize the passage.**

Heads-up: Arrhenius and Brønsted-Lowry models.

1

2

Beyond the general notions of acids and bases introduced in physical science (for example), this advanced review of the topic examines two relevant models:

- Arrhenius Model
- Brønsted-Lowry Model

Students should look for similarities and differences of weak vs. strong acids – and the determination of acidity of a solution. Also students should be on-the-look-out for concepts of titration, the titration curve (also called the pH curve), and descriptions of buffered solutions.

Adapted from Honeycutt Science online virtual chemistry textbook.

Re-write words you underlined

3

_____ _____ _____

_____ _____ _____

Using a complete sentence, summarize or rephrase the passage

4

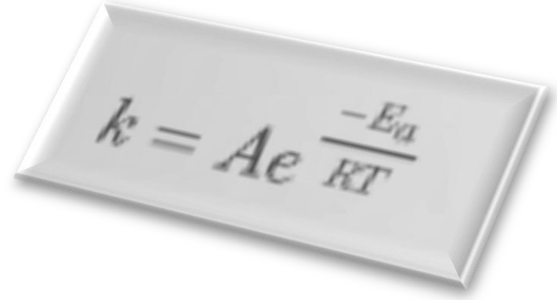
Research and Describe

Key words / expressions presented below are likely NOT in your high school chemistry textbook. You may need to search for definition of these key words on-line – or, more advanced versions of a textbook.

Arrhenius equation

The Arrhenius equation is a formula for the temperature dependence of reaction rates. This equation has a vast and important application in determining rate of chemical reactions and for calculation of energy of activation.

It can be used to model the temperature variation of diffusion coefficients, population of crystal vacancies, creep rates, and many other thermally-induced processes/reactions.



What is meant by “thermally-induced processes/reactions?”

What is a “diffusion coefficient?”

When might a “population of crystal vacancies” take place?

In chemistry/science, what is meant by “creep rates?”

https://en.wikipedia.org/wiki/Arrhenius_equation

Research and Describe

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Brønsted–Lowry acid–base theory

The Brønsted–Lowry theory is an acid–base reaction theory which was proposed independently by Johannes Nicolaus Brønsted and Thomas Martin Lowry in 1923.

The fundamental concept of this theory is that when an acid and a base react with each other, the acid forms its conjugate base, and the base forms its conjugate acid by exchange of a proton (the hydrogen cation, or H+).

NOTE: This theory is a generalization of the Arrhenius theory.

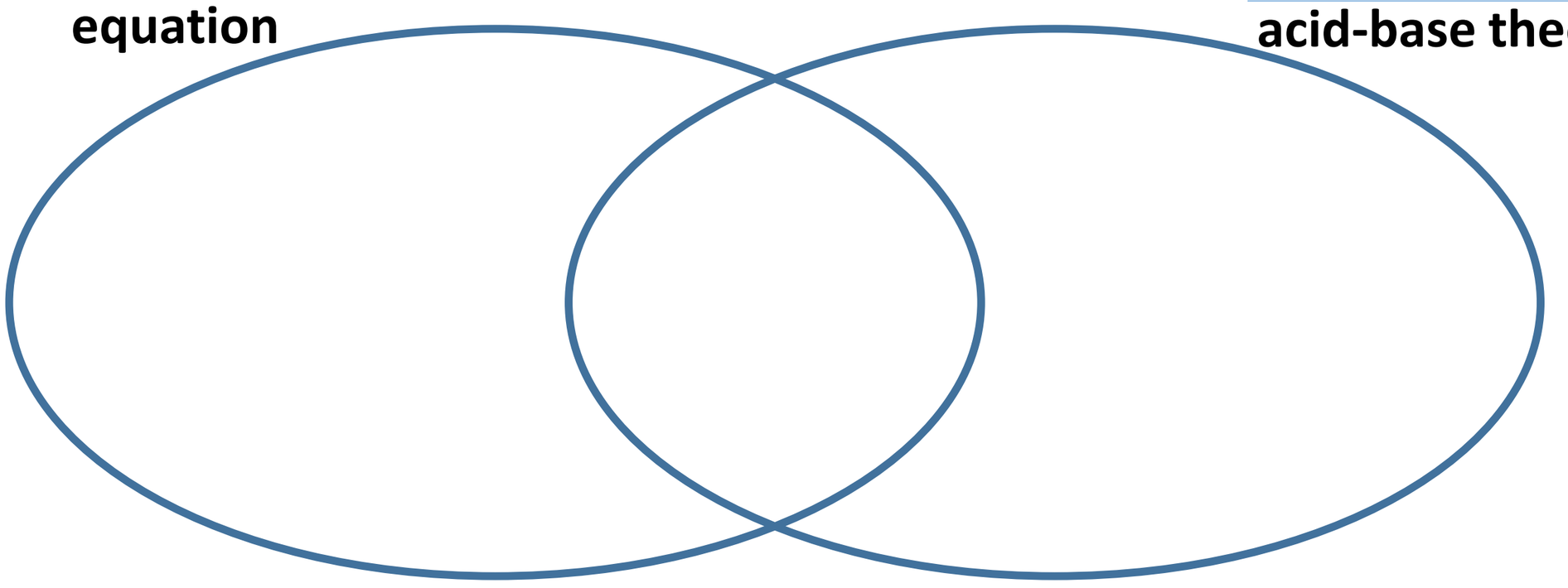
What is meant by "This theory is a generalization …?"

What is meant by a "conjugate?"

Complete a Venn Diagram

Arrhenius equation

Brønsted–Lowry acid-base theory



https://en.wikipedia.org/wiki

Show-Off Your Smarts!

Research home or industrial uses for each acid listed.

Hydrochloric acid

Nitric acid

Hydrolodic acid

Perchloric acid

Chloric acid

Sufurous acid

Methanoic acid

Phosphoric acid

Nitrous acid

Hydroflouric acid

https://www.thoughtco.com/list-of-strong-and-weak-acids-603642