17.1 Naming Complex Compounds

Chemistry

Summarize main points from each video.

Video Title / topic _____

Video Title / topic _____

Video Title / topic _____

Topic Introduction

Summarize your understanding of each paragraph.

Acquaint yourself with this new expression. **Polyatomic ions** are composed of several atoms bound together. Ionic compounds containing polyatomic ions are NOT binary compounds – because they contain more than two elements.

Naming ionic compounds containing polyatomic ions is similar to naming binary ionic compounds. The difference is that the polyatomic ion has a unique name not found on the Periodic Table.

There are some general “rules” for naming acids. The two categories of acids are those that contain oxygen in the anion – and those that do NOT contain oxygen in the anion. Remember the anion is the ion with a negative charge. Two examples are CN^- and NO_2^- .

When the anion does not contain oxygen, the acid is named with the prefix “hydro” … HCN is hydrocyanic acid. When the anion contains oxygen, the acid name is formed from the root name of the central element. HNO_2 is called nitrous acid, for example.

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.**

Naming Acids

1

When dissolved in water, certain molecules produce H^+ ions.

2

These substances were initially recognized by the sour taste of their solutions. For example, citric acid is responsible for the tartness of lemons and limes.

Acids can be viewed as a molecule with one or more H^+ ions attached to an anion. The rules for naming an acid depend on whether the anion contains oxygen.

Adapted from World of Chemistry, Zumdalhl/DeCoste page 113.

Re-write words you underlined

3

_____ _____ _____

_____ _____ _____

Using a complete sentence, summarize or rephrase the passage

4

Read Text for Comprehension

Read this article for deeper understanding. No summary is required, although you may want to circle, underline, or mark key ideas and words.

An acid is a molecule or ion capable of donating a hydron, proton or hydrogen ion H^+, or, alternatively, capable of forming a covalent bond with an electron pair (a Lewis acid).

The first category of acids is the proton donors or **Brønsted acids**. In the special case of aqueous solutions, proton donors form the hydronium ion H_3O^+ and are known as Arrhenius acids. Brønsted and Lowry generalized the Arrhenius theory to include non-aqueous solvents. A Brønsted or Arrhenius acid usually contains a hydrogen atom bonded to a chemical structure that is still energetically favorable after loss of H^+.

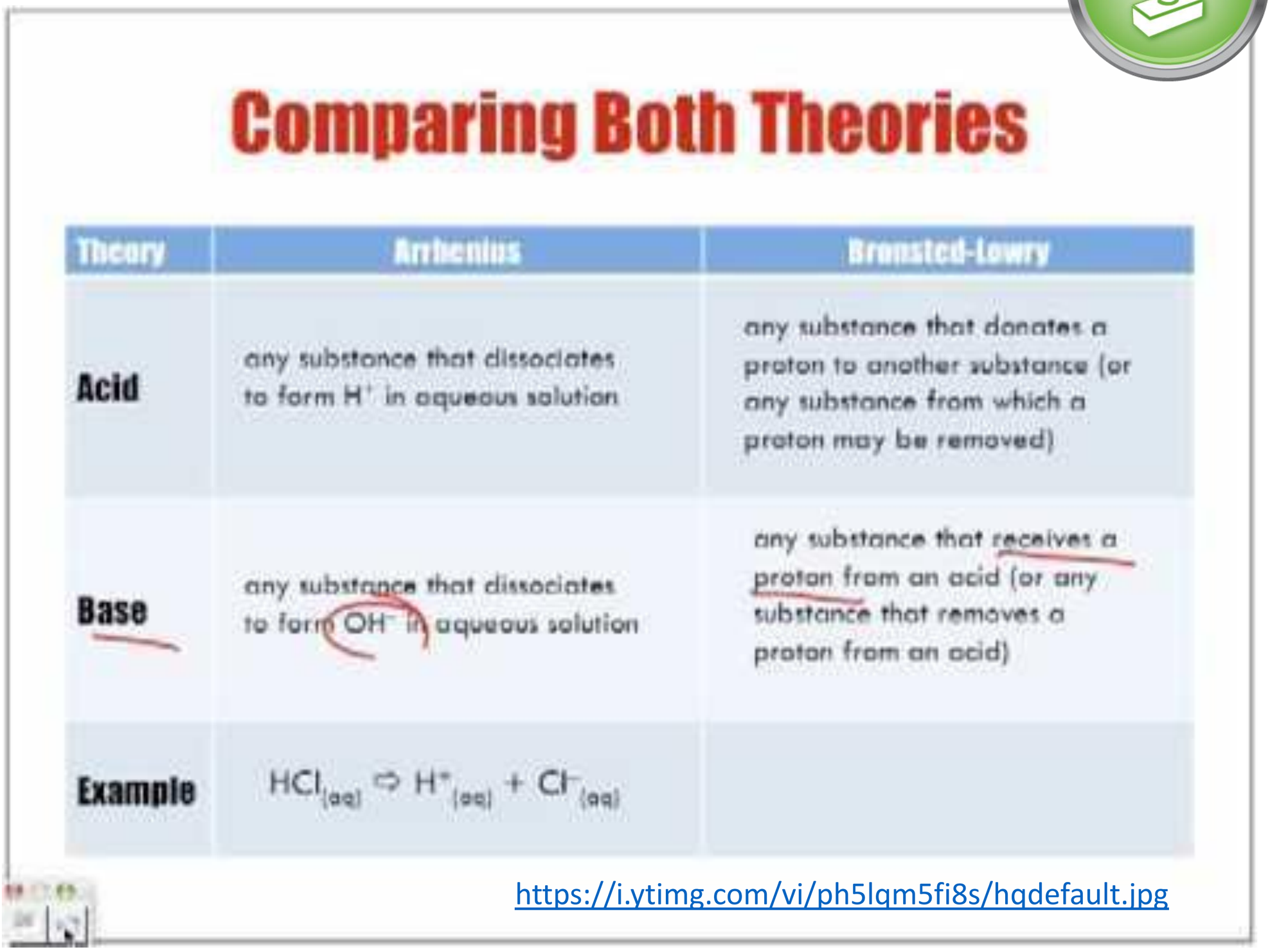
The second category of acids are **Lewis acids**, which form a covalent bond with an electron pair. An example is boron trifluoride (BF_3), whose boron atom has a vacant orbital which can form a covalent bond by sharing a lone pair of electrons on an atom in a base, for example the nitrogen atom in ammonia (NH_3). Lewis considered this as a generalization of the Brønsted definition, so that an acid is a chemical species that accepts electron pairs either directly or by releasing protons (H^+) into the solution, which then accept electron pairs.

However, hydrogen chloride, acetic acid, and most other Brønsted-Lowry acids cannot form a covalent bond with an electron pair and are therefore not Lewis acids. Conversely, many Lewis acids are not Arrhenius or Brønsted-Lowry acids.

In modern terminology, an acid is implicitly a Brønsted acid and not a Lewis acid, since chemists almost always refer to a Lewis acid explicitly as a Lewis acid.

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

Draw Illustration



Comparing Both Theories

Theory	Arrhenius	Bronsted-Lowry
Acid	any substance that dissociates to form H^+ in aqueous solution	any substance that donates a proton to another substance (or any substance from which a proton may be removed)
Base	any substance that dissociates to form OH^- in aqueous solution	any substance that receives a proton from an acid (or any substance that removes a proton from an acid)
Example	$HCl_{(aq)} \Rightarrow H^+_{(aq)} + Cl^-_{(aq)}$	

https://i.ytimg.com/vi/ph5lqm5fi8s/hqdefault.jpg

Draw (Copy) the Illustration Here

Interpret a Diagram

What might be a good title for this diagram?

_____

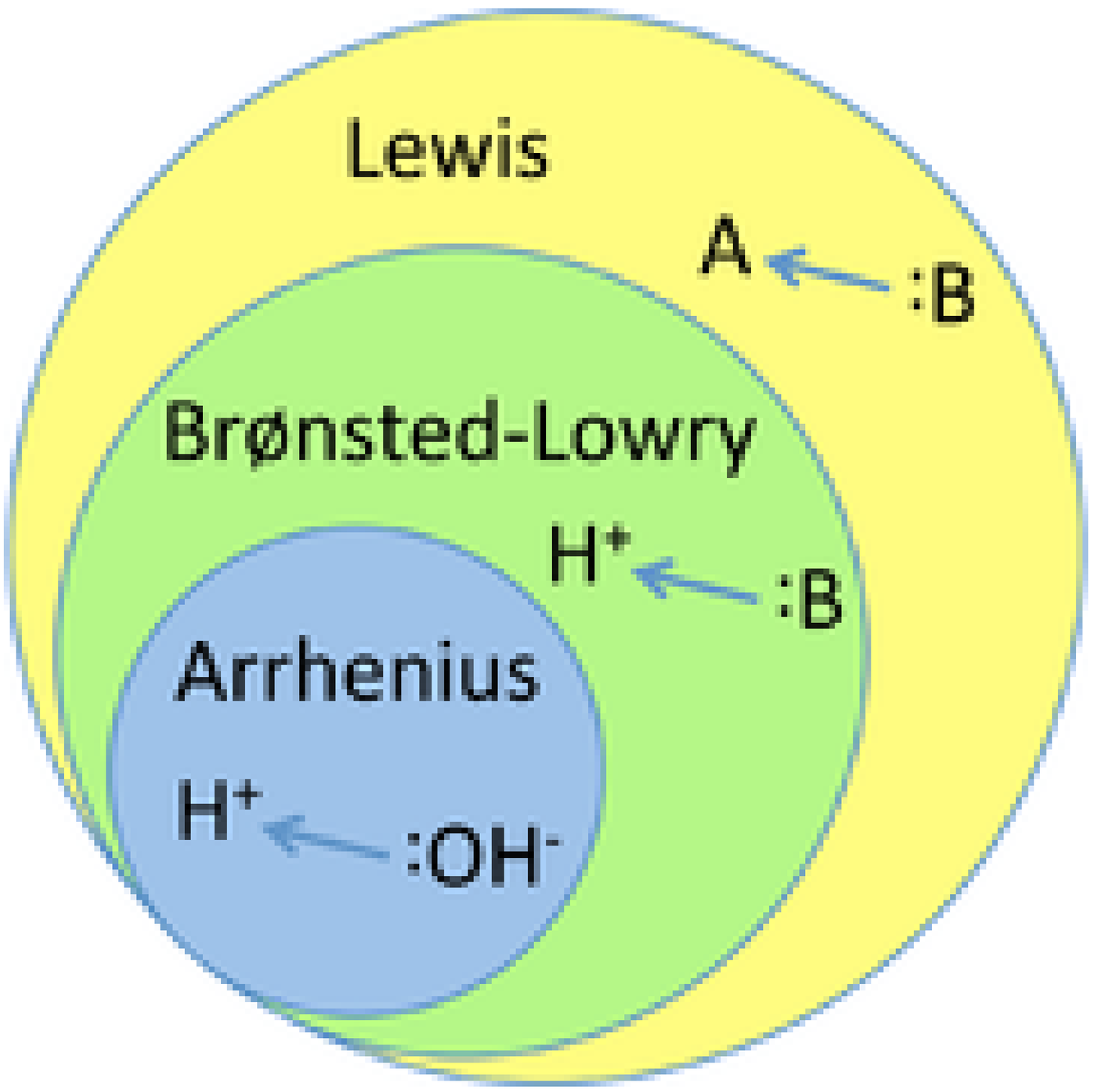
Why are there three circles shown?

_____

What do the arrows imply?

_____

https://chem.libretexts.org



Show-Off Your Smarts!

Instructions

- Complete as an individual or small group.
- Discuss your ideas/answers/responses in a small group.
- Select one person to present your responses to the class.

Q1. How can this information be applied to a young-person's life?

Q2. How does this information apply to (or impact) communities?

Q3. When do scientists need to apply this information? How?

Q4. How would a person from 100 years ago view this information?

Q5. How does this topic connect to other science topics or math?

Write down at least three words introduced or covered by this topic.

1.
2.
3.
4.
5.
6.

Make a Poster

In the space provided here, create/draw a poster which conveys the concepts you have learned on this topic.