Polyatomic Ions are groups of two or more elements that have a charge associated with them as a group. They can in turn then bond to other elements or polyatomic ions to form more complex structures. In this section, we will discuss the history of the polyatomic ion, go over some definitions, some naming procedure, and provide some useful vocabulary, videos, and study aids for this subject.

History

Explore the discoverer's biography, including general facts about his life and anecdotes regarding how he made this particular discovery. Also see other significant scientific discoveries built largely on this concept and other real-world applications in history that may not still be relevant.

Discoverer/Developer

Michael Faraday (1791-1867) introduced the term 'ion' in 1834 for the then-unknown species that goes from one electrode to the other through an aqueous medium. He wasn't sure of the nature of the actual ions, but when two electrodes were placed in an aqueous solution, a current could travel between the electrodes. He knew there was something in the solution to make that possible.

Later, Svante Arrhenius (1859-1927) confirmed this theory. He was a many-talented Swede who received the 1903 Nobel prize for chemistry and who (among his many achievements) first suggested the "greenhouse effect." Arrhenius proposed in 1884 that when a compound like table salt, NaCl (sodium chloride), was dissolved in water, it broke up into electrically charged "ions" Na^+ and Cl^-. Electric forces made Na^+ ions move in one direction, Cl^- ions in the opposite one, and that was how the electric current was carried.

Concept Definition

Study the primary definition of this concept, broken into general, basic, and advanced English definitions. Also see the mathematical definition and any requisite background information, such as conditions or previous definitions.

Basic

A polyatomic ion is a group of two or more atoms covalently bonded or metallically bonded together to function as a single ion. An example would be the hydroxide ion, OH^-. The oxygen and hydrogen are covalently bonded together, and function as a single anion with a 1- charge. Polyatomic ions can also be viewed as the conjugate acid/base of a neutral molecule. Using the hydroxide example, OH^- is the conjugate base/acid of water.

Advanced

Naming

Very Useful Naming Introduction/Guide - Credit given to Fred Senese (General Chemistry Online)

"Because polyatomic ions are the building blocks of so many ionic compounds, learning the names, charges, and formulas of the most common polyatomic ions is absolutely essential before many other skills can be mastered."

Website:

[LINK URL: http://antoine.frostburg.edu/chem/senese/101/compounds/polyatomic.shtml]

Background Information

Ion is Greek for "the ones that move". This makes sense because in an atom, the protons and neutrons are in the center while the electrons move around. The surplus/lack of electrons is what causes a positive or negative charge.

Vocabulary

Learn important vocabulary for this concept, including words that might appear in assessments (tests, quizzes, homework, etc.) that indicate the use of this concept.

Important Vocabulary	Term	Context
Conjugate acid/base	When an acid (HX) reacts with water, it produces H_3O^+ acidic water (H^+	
Electrode	A conductor from which electricity enters or leaves an object or region. There	
Polyatomic ion	An ion made of two or more elements acting as a single unit.	

Videos

Browse relevant videos from the Journal of Chemical Education's (JCE) Chemistry Comes Alive! library and other video sources.

LEWIS STRUCTURES OF POLYATOMIC IONS BY MR. B.

Lewis Structure

Formulas Lesson 5: Polyatomic Ions

Polyatomic Ions

Study Aides

Uncover helpful study tools, such as a mnemonic device or alternative ways to master the concept.

Study Aides

Additional Resources

Common Polyatomic Ions:

http://www2.pvc.maricopa.edu/tutor/chem/chem130/nomenclature/polyatomicion.html [URL: http://www2.pvc.maricopa.edu/tutor/chem/chem130/nomenclature/polyatomicion.htmlhttp]

[LINK URL: http://www.fccj.us/PolyatomicIons/polyionformulaCO3.html]

Works Cited

Review the works cited to write the researched parts of this page, such as the discover's biographical information and other areas.

Works Cited

http://en.wikipedia.org/wiki/Ion [URL: http://en.wikipedia.org/wiki/Ionhttp]

http [URL: http://en.wikipedia.org/wiki/Ionhttp]
://www-spof.gsfc.nasa.gov/Education/whposion.html

[LINK URL: http://en.wikipedia.org/wiki/Polyatomic_ion]