

Metallic bonding is where electrons freely move around a metal lattice (metal atoms close together) to form a bond between all of the metals. In this page, we will discuss the discovery of metallic bonding, its definition, its uses, and include some animations, real world applications, and vocabulary to better understand this concept.

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

William Hume-Rothery was a British metallurgist who graduated with high honors in chemistry from Magdalen College, Oxford. He attained his Ph.D. at Royal School of Mines. After World War II, he returned to Oxford to research intermetallic chemistry. During this time, he tried to find out more about the kind of bonding in metals. This is where he formed his hypothesis of metallic bonding.

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 metallic bond can be defined as the strong force that results from delocalized electrons (conduction electrons) grouped in a freely moving 'electron sea' that surrounds more than one positively charged metal ion (cation). Because of this sharing of electrons between multiple cations, a better term would be metallic bonding, because there is no such thing as a single metallic bond.

This type of bonding is what makes metals so strong, malleable, conductible, and often shiny (metallic luster). This strong bond is also why there is such a high boiling point and melting point for most metals.

Real World Application

Discover processes or disciplines in the natural or man-made worlds that employ the concept.

Metal alloys are created through metallic bonding. Two examples of alloys are brass (zinc and copper) and steel (carbon and iron). Metallic bonding is utilized for its conductive properties to help transfer electricity throughout a house via copper wiring.

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
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Videos

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

Metallic Bonding Animation

Animation on Metallic Bonds

Metallic Bonding

Metallic bonding.

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

"Library and Archive Catalogue". Royal Society. Retrieved 21 November 2010.

Hume-Rothery Bio, The Golden Years, Jack Christian, Department of Materials at Oxford University [LINK URL:

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