

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

Marcus Oliphant (1901-2000) was the first person to experimentally demonstrate nuclear fusion. Oliphant was born in Kent Town, Australia, the oldest of five children. After graduating with a physics degree from the University of Adelaide in Australia, he worked under Ernest Rutherford at Cambridge University, who discovered the proton and came up with the planetary model of the atom. Gilbert Lewis, who developed Lewis dot structures, gave Rutherford and Oliphant a gift of heavy water, or deuterium. Oliphant caused two deuterium atoms to undergo a fusion reaction to form the previously undiscovered tritium atom, or hydrogen with two neutrons, and Helium-3. After his discovery of fusion, Oliphant worked on the Manhattan Project, the U.S. project aimed at producing nuclear bombs, but after the atomic bombs were dropped in Japan he turned against the use of nuclear weapons. Also, Oliphant helped develop centimeter wave radar, which was vital in the battle against German U-boats during WWII. Later in his life he was asked to be the governor of South Australia. He was knighted and awarded the Hughes Medal for his contributions to nuclear science.

Real World Application

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

Fusion reactions occur in the core of the sun and all stars, where hydrogen is turned into helium. This is how the sun produces energy.

Hydrogen bombs work by fusion. A standard nuclear fission bomb (uranium and plutonium) goes off, heating hydrogen isotopes under high pressure, which causes the hydrogen isotopes to begin fusing.

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.

Nuclear Fusion Alternative Energy

A Discovery Channel segment about nuclear fusion in the sun and using nuclear fusion for power on earth.

Nuclear Fusion

Fusion reactions are described using the sun as an example.

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

[LINK URL: <http://www.australianbiography.gov.au/subjects/oliphant/>]