

28 3 fission and fusion of atomic nuclei

section review

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Nuclear Fission and Fusion: A Comprehensive Guide**

What is Fission and Fusion of Atomic Nuclei?

- **Nuclear Fission:** A process where a heavy atomic nucleus splits into two or more lighter nuclei, releasing a large amount of energy.
- **Nuclear Fusion:** A process where two lighter atomic nuclei combine to form a heavier nucleus, also releasing a large amount of energy.

Is Nuclear Fission and Fusion Safe?

- Nuclear fission is a controlled process used in nuclear reactors to generate electricity, but it can pose risks associated with radiation and waste disposal.
- Nuclear fusion is still under development as a potential future energy source and is considered inherently safer than fission due to its lower radioactivity and waste production.

What Reaction Results in the Combining of Smaller Atomic Nuclei?

- **Nuclear Fusion**

Which Statement about Nuclear Reaction is Not True?

- "Nuclear reactions release energy by the conservation of mass."

What is Nuclear Fission and Fusion for Dummies?

- **Nuclear Fission:** Breaking apart a heavy nucleus like uranium into smaller nuclei, releasing energy.
- **Nuclear Fusion:** Joining two light nuclei like hydrogen into a heavier nucleus, also releasing energy.

How do you Explain Fission?

- Imagine a bowling ball splitting into two smaller balls, releasing energy. This is analogous to nuclear fission, where a heavy nucleus splits into two lighter ones.

Is Nuclear Fusion Good or Bad?

- Nuclear fusion has the potential to be a clean and virtually limitless energy source, but its development and implementation pose challenges and environmental risks.

What are the Dangers of Nuclear Fission?

- Radiation exposure to workers and the environment, potential for nuclear accidents, radioactive waste disposal challenges.

Are there any Dangers with Fusion Energy?

- Limited to intermediate risks, including radiation exposure and waste disposal, but lower than fission.

Where does Fusion Naturally Occur?

- In stars, where hydrogen atoms fuse to form helium, releasing the energy that powers the stars.

What happens when the Nuclei of Two Atoms Combine?

- **Nuclear Fusion:** They release a large amount of energy due to the decrease in mass.

Which Nuclear Reaction Releases More Energy?

- Nuclear Fusion

Which is a Real Life Example of a Nuclear Reaction ?*

- The Sun's energy is produced by nuclear fusion.

What is a Feature of Fusion Reactions but not Fission Reactions?

- The release of neutrons

What is used as Coolant in a Nuclear Reactor?

- Water, heavy water, or liquid sodium

Which Statement is True about Nuclear Fusion?

- It requires extremely high temperatures and pressures to initiate.

Why is Fusion More Powerful than Fission?

- Fusion reactions release more energy per unit of mass than fission reactions.

What is the Most Common Fuel Used in Nuclear Power Plants?

- Uranium-235

What is the Best Location for Storing Nuclear Waste?

- Deep geological repositories

What are Two Main Drawbacks of Nuclear Power?

- Waste disposal challenges, potential for accidents

Why is Uranium-235 Unstable?

- It has a neutron-to-proton ratio that is too high, making it prone to decay.

What is the Byproduct of Nuclear Fusion?

- Helium-4 and neutrons

What is the Main Problem with Fusion?

- The technical challenges of creating and sustaining the necessary high temperatures and pressures.

What is the Simple Explanation of Nuclear Fusion?

- Two atoms combine to form one, releasing energy.

What is the Define Between Nuclear Fission and Nuclear Fusion?

- Fission splits heavy nuclei, while fusion combines light nuclei.

What is Nuclear Fusion in Short Answer?

- Joining atomic nuclei to release energy.

Is the Nuclear Bomb Fission or Fusion?

- Fission

What is the Difference between Fission and Fusion Oppenheimer?

- "Fission is like a knife cutting through cheese, while fusion is like welding pieces of metal together." - J. Robert Oppenheimer

What is an Example of Nuclear Fission and Fusion Reaction?

- Fission: Uranium-235 nucleus splits into two smaller nuclei, releasing energy. Fusion: Two hydrogen atoms combine to form helium, releasing energy.

Which is More Powerful, Fission or Fusion?

- Fusion releases more energy per unit of mass.

Which Statement Describes How Nuclear Fusion and Nuclear Fission Differ?

- Nuclear fission splits heavy nuclei, while nuclear fusion combines light nuclei.

What is a Real Life Example of Nuclear Fusion?

- The energy produced by the Sun and other stars.

Is Nuclear Fusion Good or Bad?

- Nuclear fusion has the potential to be a clean and virtually limitless energy source, but it poses challenges in development and implementation.

What is Nuclear Fusion in Kid Words?

- Imagine two tiny building blocks coming together to form a bigger block, releasing energy.

Why is Fusion so Difficult?

- It requires extremely high temperatures and pressures that are difficult to sustain.

Can a Fusion Reactor Explode?

- No, unlike fission reactors, fusion reactors cannot sustain a runaway chain reaction and are inherently less risky.

What is Nuclear Fission for Dummies?

- Splitting a heavy nucleus into smaller ones, releasing energy.

Is there anything More Powerful than Nuclear Fusion?

- Antimatter annihilation

Why is Oppenheimer being Investigated?

- His role in the development of the nuclear bomb and his subsequent concerns about its implications for society.

Is a Fusion Bomb More Powerful than a Fission Bomb?

- Yes, a fusion bomb (hydrogen bomb) releases significantly more energy than a fission bomb.

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