



Section 7.3 Nuclear Reactions Study Notes

By the end of section 7.3 you should be able to understand the following:

- Fission is a nuclear reaction where a large nucleus breaks apart into two or more smaller nuclei. The daughter nuclei are often radioactive, and are difficult to dispose of.
- Fission is the source of all nuclear energy in nuclear power plants today.
- Fusion is a nuclear reaction that combines two or more smaller nuclei into one larger nucleus. Small particles and energy are given off when fusion occurs.
- Fusion is the source of the sun's energy.

NOTES

Where in Canada is nuclear power used to provide electricity to residents? Why are there not more nuclear power plants in Canada?

- 1.
- 2.
- 3.
- 4.

What is nuclear fission? Why does nuclear fission occur in large atoms? What are two of the important results of nuclear fission?

- 1.
- 2.
- 3.
- 4.

NOTES

What are the differences between chemical and nuclear reactions?

1.

2.

3.

Do the Reading Check on page 315

How can scientists make any atom undergo a nuclear reaction? Write the nuclear reaction of a nitrogen atom being bombarded with an alpha particle, producing an oxygen-17 atom and a proton.

1.

2.

What are the rules for writing a nuclear reaction?

1.

2.

NOTES

What are the five steps in the nuclear fission of a neutron and an atom of uranium-235?

- 1.
- 2.
- 3.
- 4.
- 5.

How does the fission of a neutron and an atom like uranium-235 begin a chain reaction? What would be the result of a chain reaction like this? How is this chain reaction controlled?

- 1.
- 2.
- 3.

What is the name of the Canadian nuclear reactors? What nuclear equation occurs in these reactors?

- 1.
- 2.

NOTES

What is done with nuclear wastes from most nuclear power plants? How long does it take for the radioactive waste to decay enough to be safe for human exposure?

1.

2.

What is nuclear fusion? Where does fusion naturally occur? What conditions are present in these locations that allow fusion to occur? What is the nuclear equation for fusion in the sun?

1.

2.

3.

4.

How have humans designed to use the nuclear fusion reaction here on earth?

1.