

Chapter 25 Chapter Summary

Key Concepts

25.1 Nuclear Radiation

- An unstable nucleus loses energy by emitting radiation during the process of radioactive decay.
- The three main types of radiation are alpha radiation, beta radiation, and gamma radiation.

25.2 Nuclear Transformations

- The type of radioactive decay that occurs depends on the neutron-to-proton ratio of the unstable nucleus.
- After each half-life, half of the existing atoms have decayed into atoms of a new element.
- Transmutation can occur by radioactive decay, and can also occur when particles bombard the nucleus of an atom.

25.3 Fission and Fusion of Atomic Nuclei

- In a chain reaction, some of the neutrons produced react with other fissionable atoms, producing more neutrons which react with still more fissionable atoms.
- Spent fuel rods are stored in on-site pools of water to absorb the heat they continue generating and to help reduce radiation levels.
- In nuclear fusion, light nuclei fuse to make more massive nuclei. In fission, massive nuclei split apart to form less massive nuclei.

25.4 Radiation in Your Life

- Radiation may be detected with a Geiger counter or a scintillation counter. A film badge monitors radiation exposure of individuals who work with radioactive materials.
- Radioactivity and radiation are used in medical diagnosis, and in the

treatment of some diseases, including some forms of cancer.