

Chapter 24- Applications of Nuclear Chemistry

24.1 Radioisotopes

Review- What are isotopes?

What is radioactivity?

What is a radioisotope?

*Review Chapter 3, Section 4- Changes in the Nucleus

Explain the process of half-life.

Write the half-life equation from the “Math Tip” section on the upper-left corner of page 778 and define its variables.

** Do Practice Problems 1 and 2 on page 780 using the half-life equation.*

How does carbon-14 work its way into living systems?

What is the importance of carbon-14 dating?

What is a nuclear bombardment reaction?

What is the use of a particle accelerator?

What are the two different types of nuclear bombardment reactions?

List and name the possible byproducts of nuclear bombardment reactions.

** Do Practice Problems 3 and 4 on page 785.*

24.2 Biological Effects of Radiation

What is the SI unit for radioactivity?

What is the more widely used unit of radioactivity?

What is the unit measuring radiation exposure in humans and how is it useful?

What is the use of a dosimeter?

What are some effects of radiation on living tissue?

Differentiate somatic and genetic radiation damage.

What is a Geiger counter?

What is a radiotracer?

How is radiation used to treat cancer victims?

How does irradiating food inhibit spoilage?

What is the danger of radon-222? (Note: Read “Connection” on page 791)

24.3 Harnessing the Nucleus

What is nuclear fission?

Write the nuclear equation for the bombardment of a neutron with uranium-235.

Explain how the law of conservation of mass does not apply to fission reactions.

What is the significance of Albert Einstein’s equation $E = mc^2$?

What is a nuclear chain reaction?

Explain how nuclear reactors work.

What are some concerns of nuclear power?

What is nuclear fusion?

What are the difficulties in initiating a fusion reaction?

What are some of the barriers in having fusion reactions as an alternative source of power?