

7.1 Introduction to Radiation and Radioactivity

Science 10 Notes

Inquiry:

Is all radiation bad? What are some examples of normal radiation?

How can you receive too much radiation?

Radiation vs Radioactivity

- Radiation can refer to high energy waves that are part of the electromagnetic spectrum.
- Radiation can also refer to particles or high energy waves from radioactive sources
- There is a lot of natural, background radiation. You are exposed to this every single day.
 - Only a very small amount comes from radioactivity

electromagnetic waves

Infrared (heat)

radio

visible light

microwaves

UVA, UV B

x-rays

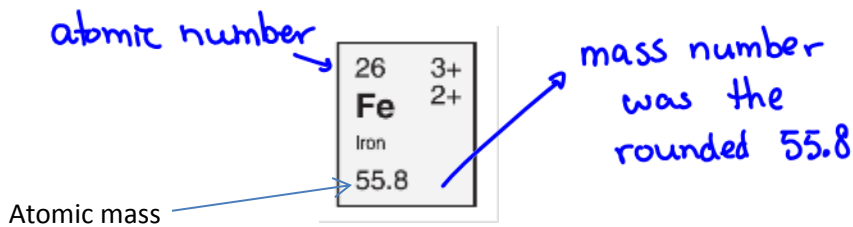
gamma waves

Radioactivity

- Radioactivity is the release of high energy waves and particles from a source as a result of changes to the nucleus of the atom.
- It comes from an unstable nucleus that is caused by:
 - too much energy energy
 - incorrect ratio of protons and neutrons
- An important part of radioactivity is understanding isotopes

Isotopes

- Recall that the nucleus contains protons and neutrons.
- The number of protons determines the kind of element.
- The number of neutrons: - has no impact on chemical reactivity.
- does not determine type of element
- Sometimes the nucleus in the atom may have more or less neutrons, but these atoms are still the same element because they have the same number of protons. These atoms with different numbers of neutrons are called isotopes.



- Atomic mass is different from mass number.
 - Atomic mass shows the average mass of all isotopes of an element
 - Mass number is the protons + neutrons

Carbon always has 6 protons.

chemical reactivity is unchanged as well

Carbon : 6p 6n
mass number = 6+6
= 12

Naming Isotopes

- Isotopes are named based on their mass number
Carbon with 6p, 6n : carbon-12
Carbon with 6p, 8n : carbon-14
- Notation for isotopes includes 3 things:

