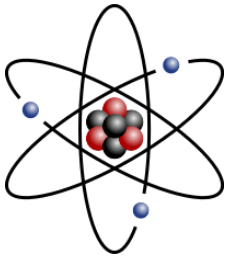
SCH3U – Trends, Matter and Bonding

Application Assignment: Isotopes & Radioisotopes



Isotopes are all around us. They are used in medicine, in nuclear reactors, and naturally found in the environment. In this application assignment, you will pick an isotope and research its uses, abundance, and impacts on the human body or on the environment. You can use the list of isotopes provided below (or you can pick your own):

Medical Isotopes	○ Bismuth-213 (used in cancer therapy) ○ Iodine-131 (used in medical diagnostics) ○ Cobalt-60 (used to sterilize equipment and in some cancer treatments) ○ Technetium-99m (used in medical diagnostics) ○ Xenon-133 (used to study circulation in the human body) ○ Yttrium-90 (arthritis treatment)
Isotopes used in Industry / Processes	○ Americum-241 (used in smoke detectors) ○ Carbon-14 (used for radioactive dating) ○ Krypton-85 (used in appliances) ○ Plutonium-238 (used to power NASA spacecrafts) ○ Uranium-235 (used in nuclear power plants)
Isotopes in the Environment	○ Radon-224 (naturally occurring gas, potential carcinogen) ○ Nitrogen-15 (found in the atmosphere, can be used as fertilizer)

In your unit 1 project, address the following questions for your isotope:

- A brief description of what your isotope is used for
- The % abundance of your isotope (try to explain how the % abundance was determined by showing a calculation, a graph, or some other data…)
- How stable is your isotope? Is it prone to undergo radioactive decay? Why or why not? If it decays, what is the half-life?
- Explain how your isotope works (e.g. if it is a medical isotope – how does it fight against cancer?)
- What positive impacts does your isotope have on the human body/environment/an industrial process?
- What negative impacts does your isotope have on the environment or human health?
- Any other pertinent information about your isotope that you think relates to our unit?

After conducting your research, summarize your information in one of the following formats:

- A video presentation (limit your video to 4 minutes!)
- An infographic (use canva or another template to format your infographic). Keep it to one page!
- Include an APA works-cited as part of your assignment submission. Include 3 quality sources.

Note: To submit your assignment, upload a word document with the link to your assignment into the D2L dropbox. Please see rubric (next page). The rubric will be uploaded into the D2L drop-box as well.

Whichever option you have chosen (a presentation OR infographic), please submit your research notes (which can be in point form) along with your bibliography and link to your actual final product to the assignment dropbox on D2L

Assignment Rubric:

Brief Description of Isotope Included: [1 Mark]

% Abundance of Isotope: [3 Marks]

Isotope Stability/Half-Life/Reasons: [4 Marks]

Explanation of how isotope works: [2 Marks]

Positive & Negative Impacts of Isotope to Environment/Health: [4 Marks]

Ability to apply project to Unit 1 concepts (terminology, vocabulary, concepts): [2 Marks]

Communication: [4 Marks]

- Bibliography included
- Video is 4 minutes or less / Infographic is 1 page
- Clear speaking & visuals / Clear writing (spelling & grammar)
- Originality (assignment is not copied/plagiarized from internet/sources/other students)

ASSIGNMENT TOTAL: ____ / 20 Marks