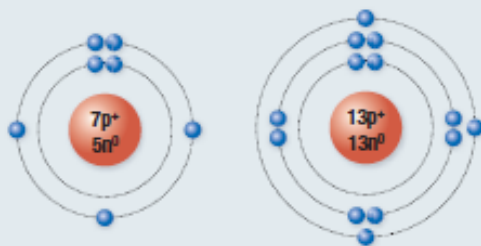


7.1 Questions

- Draw a Bohr–Rutherford diagram for each isotope. **K/U C**
 - oxygen-16
 - potassium-40
- Draw Bohr–Rutherford diagrams for hydrogen, deuterium, and tritium.
 - Identify their similarities and differences. **K/U C**
- For each Bohr–Rutherford model shown in **Figure 8**,
 - determine the atomic number and the mass number
 - write the chemical name of the isotope **K/U**

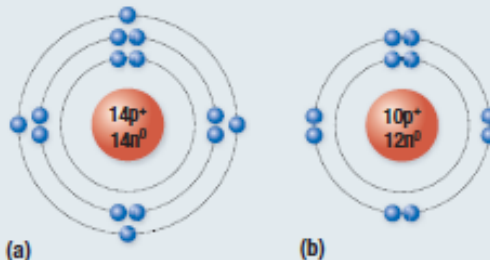


(i)

(ii)

Figure 8

- Draw a Bohr–Rutherford diagram for each isotope of beryllium.
 - ${}^7_4\text{Be}$
 - ${}^9_4\text{Be}$
 - ${}^{11}_4\text{Be}$
 - Explain the similarities and differences between these models.
 - Which isotope of beryllium is the most common in nature? Explain how you know. **K/U C**
- Draw a Bohr–Rutherford model for each isotope.
 - lithium-5, ${}^5_3\text{Li}$
 - oxygen-20, ${}^{20}_8\text{O}$
- Describe how each isotope compares with its most commonly occurring isotope. **K/U C**
- Identify each isotope shown in **Figure 9** given its Bohr–Rutherford diagram. **K/U**



(a)

(b)

Figure 9

7.2 Questions

- Write the nuclear reaction equation for each atom undergoing alpha decay (refer to the periodic table). **K/U**
 - curium-248
 - radium-223
- Write the nuclear reaction equation for each atom undergoing beta-negative decay (refer to the periodic table). **K/U**
 - sulfur-35
 - gold-198
- Write the nuclear reaction equation for each atom undergoing beta-positive decay (refer to the periodic table). **K/U**
 - sodium-22
 - calcium-39
- The positron is a very interesting particle. Conduct some research on the positron and describe some of its properties. Summarize your findings in a one-page report. **T/A C**
- Write nuclear reaction equations for each atom undergoing electron capture (refer to the periodic table). **K/U**
 - potassium-40
 - carbon-11
- The strong nuclear force has a peculiar property. At distances less than 0.5 femtometres (5×10^{-16} m), the force reverses from strong attraction to strong repulsion. Suggest why this might be necessary. **C A**

