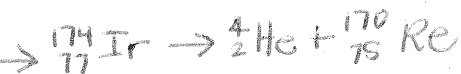


Atomic symbol	Atomic number	Protons	Neutrons	Electrons	Atomic mass
B	5	5	6	5	11
Na	11	11	13	11	24
Ga	31	31	37	31	68
Y	39	39	50	39	89
Cu	29	29	35	29	64
Tc	43	43	57	43	100
Pb	82	82	125	82	207
Yb	70	70	102	70	172
Ag	89	89	136	89	225
Mo	42	42	53	42	95
Tl	81	81	125	81	206
Fm	100	100	159	100	259
No	102	102	159	102	261
Yb	70	70	102	70	172
Sg	106	106	159	106	265

Using your knowledge of nuclear chemistry, write the equations for the following processes:

- The alpha decay of iridium-174
- The beta decay of platinum-199
- Write the symbols for an alpha particle, beta particle, gamma ray



Average atomic mass

- Silver has two isotopes silver-107 has a mass of 106.905 amu (52.00%) and silver-109 has a mass of 108.905 amu (48.00%). What is the atomic mass of silver? 107.86 amu
- Boron-10 and boron-11 are the naturally occurring isotopes of elemental boron. If boron has an atomic mass of 10.81 amu, which isotope occurs in greater abundance? Boron-11

Chapter 5

Wavelength, frequency, speed, and energy

Bohr model of the atom

Principle energy levels

Energy sublevels

Atomic orbitals

Electron configurations

Orbital diagrams

Valence electrons

Electron dot structures

Practice problems

Draw the bohr model, write the electron configurations and draw the orbital diagrams of the following elements:

- sodium $1s^2 2s^2 2p^6 3s^1$
- iron $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$
- bromine $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^5$
- barium $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2$
- neptunium $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10} 6p^6 7s^2 5f^5$

Determine what elements are denoted by the following electron configurations:

- $1s^2 2s^2 2p^6 3s^2 3p^4$ sulfur
- $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^1$ rubidium
- $[\text{Kr}] 5s^2 4d^{10} 5p^3$ antimony
- $[\text{Xe}] 6s^2 4f^{14} 5d^6$ osmium
- $[\text{Rn}] 7s^2 5f^{11}$ einsteinium

Wavelength, frequency, speed, and energy

- The laser in a compact disc (CD) player uses light with a wavelength of 780 nm. What is the frequency of this light? $3.8 \times 10^{14} \text{ s}^{-1}$
- What is the energy of a photon of red light having a frequency of $4.48 \times 10^{14} \text{ Hz}$? $2.97 \times 10^{-19} \text{ J}$
- What is the energy of an ultraviolet photon having a wavelength of $1.18 \times 10^{-25} \text{ J}$?

Electron dot structures

- Draw the electron-dot structures for each of the following atoms: carbon, arsenic, polonium, potassium, barium

Chapter 6 and chapter 7

The periodic table

Groups

