

1. Which subatomic particles are charged? What are their individual charges? protons (+)
electrons (-)
2. Describe the general structure of a typical atom by identifying where each subatomic particle is located.
protons and neutrons are located in the nucleus a very small, dense regions. Electrons reside outside the nucleus in energy levels
3. Which subatomic particle identifies an atom as that of a particular element? How is this particle related to the atom's atomic number?
Protons define the element. The number of protons is the same as the atomic number
4. Which subatomic particles account for most of an atom's mass? protons + neutrons
↳ equals the mass number
5. Complete the table for the following isotopes.

| isotope | # of protons | # of electrons | # of neutrons | Atomic # | Mass # |
|-------------------|--------------|----------------|---------------|----------|--------|
| ⁵⁵ Mn | 25 | 25 | 30 | 25 | 55 |
| ²³ Na | 11 | 11 | 12 | 11 | 23 |
| ⁸⁰ Br | 35 | 35 | 45 | 35 | 80 |
| ⁸⁹ Y | 39 | 39 | 50 | 39 | 89 |
| ⁷⁵ As | 33 | 33 | 42 | 33 | 75 |
| ²²⁷ Ac | 89 | 89 | 138 | 89 | 227 |

6. How are isotopes of the same element alike? How are they different?

Isotopes of an element will have the same number of protons.
They are different by the number of neutrons

7. Nitrogen has two naturally occurring isotopes, N-14 and N-15. The atomic mass of nitrogen is 14.007 amu. Which isotope is more abundant in nature? Explain your answer.

N-14 would have to be more abundant because the atomic mass is closer to 14 than 15.

8. Given the relative abundance of the following naturally occurring isotope of silver, calculate the average atomic mass of silver. Show your work.

silver-107: 52.00% 106.905 amu

silver-109: 48.00% 108.905 amu

$$AM = (106.905 \cdot 0.5200) + (108.905 \cdot 0.4800)$$

$$= 107.865 \text{ amu}$$

$$55.59 + 52.27 = 107.86 \text{ amu}$$

- if using sig figs.