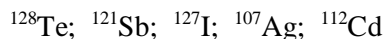


## ANSWERS TO "TRY YOURSELF" PROBLEMS FROM STUDY SECTION 2.1

### Try Yourself 2.1

Which one of the following atoms contains the largest number of protons?



### Answer:

Look on the periodic table for the atom number, Z.

$^{128}\text{Te}$  (Z = 52 protons)

$^{121}\text{Sb}$  (Z = 51 protons)

**$^{127}\text{I}$  (Z = 53 protons)**

$^{107}\text{Ag}$  (Z = 47 protons)

$^{112}\text{Cd}$  (Z = 48 protons)

### Try Yourself 2.2

Give the mass number of: a) a Nickel atom with 31 neutrons; b) a Bismuth atom with 127 neutrons and  
c) a Tantalum atom with 110 neutrons.

### Answers:

From the periodic table Nickel (Ni) has an atomic number of 28.

So, the mass number will be  $28 + 31 = 59$ .

From the periodic table Bismuth (Bi) has an atomic number of 83.

So, the mass number will be  $83 + 127 = 210$ .

From the periodic table Tantalum (Ta) has an atomic number of 73.

So, the mass number will be  $73 + 110 = 183$ .

### Try Yourself 2.3

What is the mass of the He-atom relative to the carbon atom?

**Given:** 1He-atom =  $6.6466 \times 10^{-27}$  kg (real mass)      **Scale:** 1 amu =  $1.6606 \times 10^{-27}$  kg

#### Answer:

If 1 amu weighs  $1.6606 \times 10^{-27}$  kg then the relative mass of a He-atom will be:

$$6.6466 \times 10^{-27} \text{ kg} / 1.6606 \times 10^{-27} \text{ kg} = 4.0025 \text{ amu}$$

**Mass of a He-atom relative to Carbon =  $4.0026 / 12 = 0.333$**  (This means that the relative mass of a He-atom is a third of the relative mass of a C-atom. You can also say that a He-atom is 66.7% lighter than a C-atom).

#### **NB!!!!**

Go to your periodic table and look at the mass number for Helium. You will see that it is 4.0026 amu.

**This means the following:** A He-atom is about 3 times lighter than a carbon atom, because this relative mass of a He-atom is relative to carbon. The same principle will apply for all the other elements on the periodic table.

### Try Yourself 2.4

What is the mass in kg of an oxygen atom?

**Given:** Relative mass of O = 16 amu      **Scale:** 1 amu  $\equiv$   $1.6606 \times 10^{-27}$  kg

#### Answer:

Well, if 1 amu weighs  $1.6606 \times 10^{-27}$  kg the 16 amu's should weigh:

$$16(1.6606 \times 10^{-27} \text{ kg}) = 2.657 \times 10^{-26} \text{ kg}$$

So, the real mass of an Oxygen atom is  $2.657 \times 10^{-26}$  kg/atom or  $2.657 \times 10^{-23}$  gram/atom.