

Chapter 2 (exercises)

Q1. Sample exercise 2.5 page 51

Which two of the following elements would you expect to show the greatest similarity in chemical and physical properties. B, Ca, F, He, Mg, and P.

Answer:

Ca and Mg they have the same properties because they belong to the same group (2A, the alkaline earth element)

Q2. Practice exercise page 51

Locate Na and Br on the periodic table. Give the atomic number of each, and locate each a metal, metalloid and nonmetal.

Answer:

Na atomic number 11, is a metal.

Br atomic number 35, is a nonmetal.

Q3. Sample exercise 2.7 page 55

Give the chemical symbol, including mass number, for each of the following ions.

- a) The ion with 22 protons, 26 neutrons and 19 electrons .
- b) The ion of sulfur that has 16 neutrons and 18 electrons.

Answer:

- a) The metal is Ti has 22 protons and 19 electrons, means $22 - 19 = 3$ extra protons (+3)
The ion is Ti^{3+} .

Mass number = $22 + 26 = 48$

- b) S has atomic number = 16 than mass number = $16 + 16 = 32$

Because S has 16 protons and 18 electrons , therefore sulfur has 2 electrons extra

Than the sulfur ion is $^{32}\text{S}^{2-}$

Q4. Practice exercise page 55

How many protons and electrons does the $^{97}\text{Se}^{2-}$ ion possess?

Answer:

Atomic number of Se = 34 = number of electrons

Se^{2-} has 2 electrons extra than the number of Se^{0} = 36

Number of electrons = 36

Number of protons = 34

Number of neutrons $97 - 34 = 45$

Q5. Practice exercise page 55

Predict the change expected for the most stable ion of a) Al and b) fluorine.

Answer:

a) Al has atomic number = 13 and the nearest noble gas is Ne = 10 atomic number. Than Al loss 3 electrons to form Al^{3+} .

b) F has atomic number = 9, which is nearest Ne. Than F gain one electron and become F^{-} ion.

Q6. Practice exercise page 56

Which the empirical formula for the compounds formed by the following ions;

a) Na^{+} and PO_4^{3-} empirical formula is Na_3PO_4 .

b) Zn^{2+} and SO_4^{2-} empirical formula is ZnSO_4 .

c) Fe^{3+} and CO_3^{2-} empirical formula is $\text{Fe}_2(\text{CO}_3)_3$