

Atomic Mass, Atomic Number and Isotopes

Name - _____

1.) How many protons are in the nucleus of each of the following?

a.) Be 4

b.) U 92

c.) Mn 25

2.) How many electrons are there in a neutral atom of each of the following?

a.) C 6

b.) Fe 26

c.) Ar 18

3.) How many electrons are there in each of the following atoms?

a.) Na⁺ 10c.) V³⁺ 20e.) Cl⁻ 18g.) Sb³⁻ 54i.) H⁻ 2b.) Mg²⁺ 10d.) O²⁻ 10f.) Al³⁺ 10h.) Fe²⁺ 24j.) As³⁺ 30

4.) What is the ion produced when:

a.) two electrons are added to S? S²⁻e.) an electron is added to Cr³⁺? Cr²⁺b.) two electrons are removed from Ca? Ca²⁺f.) two electrons are removed from Mn²⁺? Mn⁴⁺c.) an electron is added to Cl? Cl⁻g.) an electron is removed from V⁴⁺? V⁵⁺d.) three electrons are removed from Al? Al³⁺h.) two electrons are added to Sb⁻? Sb³⁻

5.) What is the charge on the nucleus of each of the following?

a.) Mg +12

b.) Ne +10

c.) K⁺ +19d.) S²⁻ +16

6.) The following mixtures of isotopes are found in nature. Calculate the average mass of each mixture.

a.) ⁶⁹Ga = 60.0%, ⁷¹Ga = 40.0% $(0.600 \times 69) + (0.400 \times 71) = 69.8 \text{ g}$ b.) ¹⁰⁷Ag = 51.8%, ¹⁰⁹Ag = 48.2% $(0.518 \times 107) + (0.482 \times 109) = 108.0 \text{ g}$ c.) ⁷⁰Ge = 20.5%, ⁷²Ge = 27.4%, ⁷³Ge = 7.8%, ⁷⁴Ge = 36.5%, ⁷⁶Ge = 7.8% $(0.205 \times 70) + (0.274 \times 72) + (0.078 \times 73) + (0.365 \times 74) + (0.078 \times 76) = 72.7 \text{ g}$ d.) ⁶⁴Zn = 48.9%, ⁶⁶Zn = 27.8%, ⁶⁷Zn = 4.1%, ⁶⁸Zn = 18.6%, ⁷⁰Zn = 0.6% $(0.489 \times 64) + (0.278 \times 66) + (0.041 \times 67) + (0.186 \times 68) + (0.006 \times 70) = 65.5 \text{ g}$