

REVIEW QUESTIONS

Chapter 4

- Complete each question below with an appropriate term:
 - Noble gases Un-reactive elements in the last group of the periodic table.
 - Compound A pure substance of two or more atoms with a fixed ratio.
 - Transition metals Elements between the main group elements.
 - Alkaline-earth metals Elements in group 2 of the periodic table.
 - Solutions Another name for homogeneous mixtures.
- Name and write symbol for each element described below:
 - Alkali metal in period 4: K, potassium
 - Halogen in period 2: F, fluorine
 - Alkaline-earth metal in period 3: Na, sodium
 - Metalloid in period 3: Si, silicon
 - Noble gas in period 5: Xe, xenon
- Identify each of the following as element, compound, homogeneous mixture or heterogeneous mixture:
 - tap water homogeneous mixture
 - Sand on the beach heterogeneous mixture
 - Aluminum foil element
 - Pizza heterogeneous mixture
 - Baking Soda compound

4. For each element below, use the information given to determine the number of protons, neutrons and electrons in its atom, and write shorthand notation for each.

a) Krypton (Kr) atomic number ($Z=36$); mass number ($A=84$)

$$p^+ = \underline{36} \quad n^0 = \underline{48} \quad e^- = \underline{36} \quad \text{Notation: } {}_{36}^{84}\text{Kr}$$

b) Barium (Ba) atomic number ($Z=56$); mass number ($A=137$)

$$p^+ = \underline{56} \quad n^0 = \underline{81} \quad e^- = \underline{56} \quad \text{Notation: } {}_{56}^{137}\text{Ba}$$

5. Complete the missing information in the table below:

Symbol	Ga	P
Protons	31	15
Neutrons	39	16
Electrons	31	15
Mass number	70	31

6. An unknown element Q has the following isotopic data:

Isotope	Mass (amu)	Abundance (%)
1	80.0	60.0
2	84.0	30.0
3	82.0	10.0

Calculate the average atomic mass of this element.

$$\begin{aligned} \text{Atomic mass} &= [(80.0 \text{ amu})(0.600)] + [(84.0)(0.300)] + [(82.0)(0.100)] \\ &= 48.0 + 25.2 + 8.20 = 81.4 \text{ amu} \end{aligned}$$

7. Complete each statement below with a suitable word or phrase:

- A) The “soccer ball” model of the atom is associate with a scientist named John Dalton.
- B) Thomson discovered the electron in 1897.
- C) Rutherford discovered that the atom was mostly hollow through the gold-foil experiment.
- D) The number of protons in an atom is called the atomic number.
- E) Isotopes of an atom have the same # of protons (atomic number) but different # of neturons (mass number).

8. Write an abbreviated electron configuration for lead (Pb) and answer the following questions:



- a) How many electrons in this atom have $n = 6$? 4
- b) How many electrons in this atom occupy f sublevel? 14
- c) How many electrons in this atom occupy p sublevels? 26

9. Name the element that corresponds to each of the following:

- a) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^{10}$ Cu, copper
- b) $[\text{Xe}] 6s^2 4f^{14} 5d^{10} 6p^3$ Bi, bismuth
- c) $[\text{Kr}] 5s^2 4d^{10}$ Cd, cadmium