Quiz (Formation of Ions)

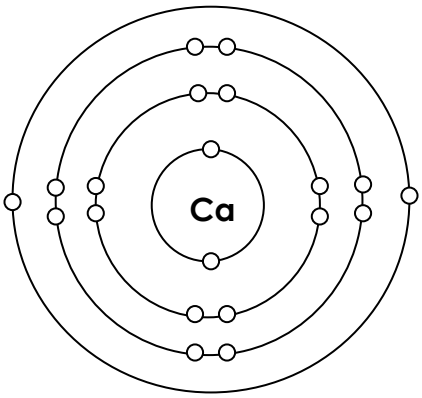
1. Consider a $^{40}_{20}Ca$ atom.
   (a) Write the numbers of protons, electrons and neutrons in the atom.
   (b) Draw the electron diagram of a $^{40}_{20}Ca$ atom.
   (c) Describe briefly how the $^{40}_{20}Ca$ atom can get the stable octet structure.
   (d) Write the numbers of protons, electrons and neutrons in the calcium ion formed from the $^{40}_{20}Ca$ atom.
   (e) What is the charge of the calcium ion?
   (f) Draw the electron diagram of the calcium ion.

2. Consider a $^{31}_{15}P$ atom.
   (a) Write the numbers of protons, electrons and neutrons in the atom.
   (b) Draw the electron diagram of a $^{31}_{15}P$ atom.
   (c) Describe briefly how the $^{31}_{15}P$ atom can get the stable octet structure.
   (d) Write the numbers of protons, electrons and neutrons in the phosphide ion formed from the $^{31}_{15}P$ atom.
   (e) What is the charge of the phosphide ion?
   (f) Draw the electron diagram of the phosphide ion.

Suggested Answer

1. (a) Number of protons: 20
number of electrons: 20
number of neutrons: 20

(b)

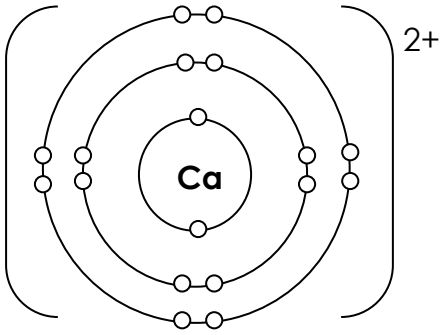


(c) The calcium atom loses two outermost shell electrons in order to get the stable octet structure (2,8).
Thus, a calcium ion is produced.

(d) Number of protons: 20
number of electrons: 18
number of neutrons: 20

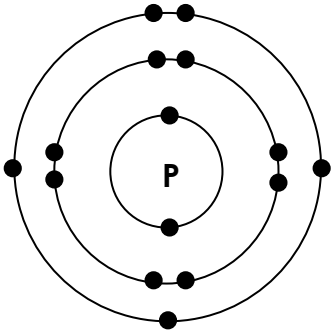
(e) +2

(f)



2. (a) Number of protons: 15
number of electrons: 15
number of neutrons: 16

(b)



(c) The phosphorus atom accepts three outermost shell electrons in order to get the stable octet structure (2,8,8).
Thus, a phosphide ion is produced.

(d) Number of protons: 15
number of electrons: 18
number of neutrons: 16

(e) -3

(f)