Question 2.23

(i) write the electronic configurations of the following ion:

(a) H^-

The electronic configuration of H: $1s^1$

Now, the electronic configuration of H^- will be $1s^2$.

(b) Na^+

The electronic configuration of Na having Z=11 is: $1s^2 2s^2 2p^6 3s^1$

Now, the electronic configuration of Na^+ will be $1s^2 2s^2 2p^6$.

(c) O^{2-}

The electronic configuration of O having Z=8 is $1s^2 2s^2 2p^4$

Now, the electronic configuration of O^{2-} will be $1s^2 2s^2 2p^6$

Question 2.23

(ii) what are the atomic numbers of elements whose outermost electrons are represented by.

(a) $3s^1$

The complete electronic configuration is $1s^2 2s^2 2p^6 3s^1$

$\Rightarrow 2+2+6+1=11$

Therefore, the atomic number of the element is 11 which is sodium (Na)

(b) $2p^3$

The complete electronic configuration is $1s^2 2s^2 2p^3$

$\Rightarrow 2+2+3=7$

Therefore, the atomic number of the element is 7 which is Nitrogen (N)

(c) $3p^5$

The complete electronic configuration is $1s^2 2s^2 2p^6 3s^2 3p^5$

$\Rightarrow 2+2+6+2+5 = 17$

Therefore, the atomic number of the element is 17 which is chlorine (Cl)

Question 2.23 (iii) Which atoms are indicated by the following configurations?

(a) $He]2s^1$

The electronic configuration of the element is $He]2s^1$ or $1s^2 2s^1$

Therefore, the atomic number of the element is 3 which is Lithium.

(b) $Ne]3s^2 3p^3$

$\Rightarrow 1s^2 2s^2 2p^6 3s^2 3p^3$

Therefore, the atomic number of the element is 15 which is phosphorus.

c) $Ar]4s^2 3d^1$

$\Rightarrow 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^1$

Therefore, the atomic number of the element is 21 which is scandium

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