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NOTES

Periodic Presence of Hydrogen in the Periodic Table

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The position of hydrogen is not clear in the periodic table. This paper presents a new approach to solve this problem.

The periodic law was set forth by D. Mendeleev in 1869. The periodic law is expressed by the periodic table. Since 1869, more than hundred forms of the periodic table have been proposed in the pursue of perfection[1].

Position of hydrogen in short from periodic table

In all these classification the position of hydrogen is not clear because hydrogen resembles the alkali metals; carbon family and the halogens. So hydrogen can be placed in either I group, IV group or VII group. But it is not justifiable to allot three places for a single element because hydrogen does not show equal degree of resemblance with alkali metal, carbon family and the halogens. Hydrogen behave more like alkali metals and halogens depending upon the conditions. Hydrogen shows less similarities with carbon family. So this situation can be explained only if hydrogen is in a periodic motion in the vacant first period of short form periodic table. Thus the periodic persence of hydrogen is possible in I group, IV group and VII group respectively[2]. IV group is the equilibrium position because it keeps equal distance with I group and VII group in short form periodic table[3]. In terms of energy, we can say that a particle undergoing harmonic motion (periodic motion) passes back and forth through a point (its equilibrium position) at which its potential energy is minimum[4]. In the same way hydrogen shows minimum resemblance with IV group.

Entropy

The periodic system is a isolated system. The total entropy of periodic system must remain constant because periodic motion of hydrogen is reversible process. In other words the periodic representation of hydrogen in I, IV and VII group will not creat any disturbance in the periodic system.

Cause of periodicity

This model shows the cause of periodicity in periodic table. As we know the

displacement of a particle in periodic motion can always be expressed in terms of sines and cosines[4].

In the same way, the periodic motion of hydrogen can be expressed in terms of groups and periods because groups and periods are perpendicular to each other. Thus oscillatory hydrogen creates a periodic behaviour both in groups and periods of periodic table.

Conclusion

Thus hydrogen shows a periodic presence in the first period. The periodic motion of hydrogen in first period makes it possible to accommodate I group, IV group and VII group respectively.

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