

Learning and Teaching Chemistry: An Innovative Pathway with special reference to rural area students

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Abstract: The present paper deals with an Innovative correlation pathway to teach some chemistry topics that are very difficult to remember or understand especially in case of rural area Hindi medium students. There are many instances in our day-to-day life that involve chemistry, its applications and its rules. The importance and scope of chemistry are huge. In this paper I have described simple correlation of subject to explain chemistry as simple as it can be which I always use during my classroom teaching. So that students are able to learn, remember, understand and explain any question without copying book matter. In this way their logical thinking ability could be enhanced and students will never face any confusion regarding subject. Consequently, as a teacher this methodology will also help them.

Keywords: Stability, Energy, Resonance, Strain, De shielding, Shielding

1.0 Introduction :

Chemistry is a study of life. Life is made of string of particulate matter.

Dr C.W Huey

Chemistry as a subject has a significant importance in our daily lives and the society in general. Our all three basic needs i.e. Food, shelter, cloth are made by different chemicals & fiber¹. Through chemistry, we get to understand how food gives energy to our bodies; this enables us to be careful regarding contaminations and also their consequences afterwards such as diseases. when we fall sick and consequently need drugs which are made by scientists through chemistry. This helps to know what drugs to take, by showing their contents and their impacts on our bodies. (Lagowski, J. J, 1991)².

Chemistry helps to understand and observe the changes around us since such changes are caused by chemistry, for example, changes of the colors of leaves It also describes various chemical elements present in the environment, their reactions, and effects on the environment. It illustrates environment segments, their interrelationships, and significances. In present scenario increasing temperature of earth are burning issue and study of environmental chemistry i.e. Global warming.

Firstly I develop interest in subject as without interest no subject can be learned as far as chemistry is concern it is very vast subject covering every aspects of human life for e. g. Medicinal, Food, Drug, Industrial, Environmental, Biochemistry etc. Today not a single area is left that does not involve chemistry. Even in relation we compare it with chemistry. In this way they realize importance of particular subject .

My explanation and correlation mode is so simple ,lucid powerful that it directly strikes into the mind of students. Our major students group belongs to rural area and from hindi medium so I have to adopt teaching method in such a manner that they could understand very well by simple logical thinking and no need to memorize lessons. As my specialization is in Organic Chemistry and students find it very difficult . e.g. Drawing of different resonating structure for ortho and para directive effect.

1.1 In chemistry elements are divided in periodic table in blocks (s,p,d,f)

Division is based on properties they possess like electronic configuration , valency ,Electronegativity, Basicity etc.

Explanation : In residential colony houses are divided into blocks according to their area no of bedrooms /hall /kitchen etc

2BHK, F block 1250 square ft,

3BHK, D block 1500 square ft,

4BHK, B block 1800 square ft,

1.2 In practical there are various organic compounds how can we identify them and why we have to follow identification systematically ?

There is systematic approach set for identification of any organic compound e.g.

- 1.Physical appearance
2. Melting point
3. Element detection
4. Functional group test
- 5.Specific test
- 6.Derivatives

Explanation: Suppose we have to search Vikas how can we search him?

There may be many Vikas in Sehore but if we know

1. Area/ colony /H.No
2. Profession : Doctor/Engineer/Teacher etc
3. Surname : Gupta/ Verma/Shukla
4. Job :Private/ Govt/ businessman

Than we easily find person within time

1.3 Proteins

Proteins are long chain peptides consisting more than 50 amino acid sequence in it. Amino acids are building blocks of peptides . According to no of amino acids names of peptides is derived and also its structure.

Explanation : when we make house bricks are needed for making wall and building, in the same manner amino acids are bricks and building blocks of peptides , as arrangement of many bricks in different fashion converted into new design of the building in a same manner arrangement of many amino acids prepares different structures of protein for eg. Globular , fibrous etc.

1.4 Intermolecular and Intramolecular H-bonding

Firstly I explain the word

Inter mean between two molecule

Intra means within the molecule H bonding as the name implies a bond formed between hydrogen and any one of the electronegative atom like oxygen, halogen and nitrogen etc

Explanation: There are three kinds of main bonds in chemistry electrovalent, covalent, coordinate. H bonding is the kind of bond formed when two molecules having H and electronegative atom come close to each other then this type of bond is formed it is shown by broken line and as compare to covalent bond it is a weak bond.

Intermolecular H bonding- if there is any competition held between two different section e.g X-A and X-B or subject group Biology and Maths group students than word inter is used.

On the other side intra means if I am going to conduct competition among the students of the same class or group then word intra is used.

1.5 Liquefaction of Gases : As we well know that there are three state of matter solid, liquid and gas. Gases molecules are far apart from each other and freely to move in atmosphere having neither fixed volume nor shape. But as we try to liquefy any gas by applying pressure than this will causes to close each molecule in a container and when they become so close to each other that creates intermolecular attractive forces among them consequently they get converted into liquid state of matter .

Explanation : on daily base e.g Suppose in a school at dispersal time students are freely to move but as principal or teachers ordered them (like applying pressure) to come close in a assembly ground consequently when they are so close that they can form a definite volume can be compared to liquid state of matter .

1.6 Shielding and Deshielding in NMR

In NMR proton said to be shielded (means electron density will be more around proton) when electron get surrounded by an electropositive atom due to this less magnetic field feel by that particular proton due to a shield formed by a circulation of an electron and thus the applied magnetic field must be increased for resonance to occur at a given frequency and the value that we obtained in NMR spectra will be towards upfield or right side of TMS scale and viceversa.

Explanation: Suppose we (proton) are standing at noon having umbrella (like electropositive atom) due to this direct impact of strong sunrays (applied magnetic field) that are falling on us would be reduced i.e. shield formed by an umbrella (can be compared to case of NMR presence of electropositive atom) reduces the intensity of sunrays but when we are without any shield or protection than we feel more heat or intensity of sunrays falling on our body increased i.e. in presence of electronegative atom electron density would be less around proton so deshielded proton requires a lower field strength for flipping.

1.7 Hund's rule of maximum multiplicity

It state that pairing of electrons in the degenerate orbitals does not take place until each of them has got one electron each.

Explanation : When in a classroom has suppose 40 chair than coming students first go to sit singly on a chair after occupying all 40 chair pairing on single chair for coming rest students should be started.

1.8 Reactivity verse stability of any compound It is well known in chemistry that any compound which is more stable will be less reactive or if any compound is very reactive or in strain due to angle/ torsional / steric strain will be less stable

Explanation : In our daily life we see a person is nature wise cool, calm ,anger and tension free will not be reactive in any situation or we can say he/ she would be stable in nature while a person having tension or panic nature will be more reactive in their behavior or consequently less stable in his/her actions .

1.9 Aufbau principle It state that in the ground stste of an atom or ion electron fills atomic orbitals of the lowest available energy levels before occupying higher levels or orbitals are filled in order of their increasing energies.

Explanation: If we have four storey building than due to greater energy required to shift a material to top floor so firstly we always tried to start filling from ground floor to topmost floor in order of their increasing energies like Aufbau principle.

2.0 Conclusion: These are few examples which I applied for teaching chemistry. In this way students find it easy to understand and able to explained in their own words.

References

1. <https://thesisleader.com> › Essays
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