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| **School of Pedagogical Sciences (SPS)**  **M.G University Kottayam as a part of Ph. D Programme**  Research Scholar  **: Shanavas K.E**  Supervising Teacher **: Dr Sajna Jaleel Professor SPS** | | | |
| **Action Script : E Content Lesson based on CDM 10**  Name of Teacher**:** Shanavas K.E Standard: XI Science  Subject: Chemistry Strength: 59  Topic: Hybridization Time : 6 minutes Chapter: Chemical Bonding and Molecular structure | | | |
| Audio | video | Tg-lg activities | Phases of CDM |
| Dear students,  Welcome to the world of Chemistry: Chapter 4 Chemical Bonding and Molecular Structure. This is the E-content Lesson based on CDM 10  Students, learn Chemistry in a simple way. Today we will learn about an important topic ‘Hybridization’  The concept of Hybridization can be understood by the following analogy.  See the colours of paint  If we mix the two cans of paint, what happens to the colour of paint.  Is it white, red or any other colour.  Yes of course, other colour pink is formed.  When we mix two bottles of white and red colour paints, how many bottles or cans of pink formed  It is known as Hybrid.  The process is known as Hybridization.  Can you predict the shape of Hybrid orbital while mixing 2s orbital and three 2px, 2py and 2pz orbitals.  Who proposed the term Hybridization and in which year?  What is Hybridization?  Can you give the salient features of hybridization  What are the possibilities of Hybridization of s, p and d orbitals  What is SP3 Hybridization  SP3 Hybridization one 2s and three 2p atomic orbitals intermix to form four SP3 Hybrid orbitals is known as SP3 Hybridization or Tetrahedral Hybridization.  Four SP3 Hybrid orbitals.    Can you give example of SP3 Hybridisation  What is SP2 or Triagonal Hybridization. Give on example.  See the slide of SP2 Hybridization  Two Hybrid orbitals of each C atom overlap with 1S orbital of two H atom to form strong C-H sigma bonds. The third SP2 orbitals of each C atom to form strong C- C sigma bond. The pure Pz orbitals of each C atoms overlap laterally to form Pi bond. Thus, double bond in ethene is made up of one sigma and one Pi bond.  What is SP Hybridization. Give an example  See the slide of SP Hybridization  In SP Hybridization in Ethyne, two C-H sigma bonds, one C-C sigma bond. Two C-C π bonds. Here 2py and 2pz orbitals lateral overlap to form π bonds.  **Time gap online Assignment**  Explain Hybridization in PCl5 and SF6  Hybridization in PCl5 In PCl5 the central atom P(Z=15) 2,8,5 Five valence electrons.  P in ground state is  3s23p3  In excited state is 3s13px13py13pz1.3d1  That is, five half-filled orbitals intermix to form five Hybrid orbitals overlap with five chlorine atoms. SP3d Hybridization  Triagonal bipyramidal shape. Bond angle 900 and 1200  Give the Hybridization of SF6  SF6 is SP3d2 Hybridization. Octahedral shape. Bond angle 900 | Teacher presents  Slide  Topic  Hybridization.  One can contain white. Other can contain red paint  Slide  Two cans of pink formed  Slide  In chemistry we mix atomic orbitals, that is one S orbital, three 2p orbitals to give four SP3 orbitals of same shape and same energy. S orbital is spherical shape while three p orbitals is dumb bell shaped in the direction of x, y and z axis.  Slide  Definition of hybridization - Chemistry Dictionary  Mixing of four atomic orbitals  What does the lobes of hybridized orbitals represent? - Quora  Four hybrid orbitals with same shape and energy.  Hybrid orbital has electron density concentrated on one side of nucleus. It has one lobe larger than the other. That is, upper lobe and lower lobe.  Slide  Linus Pauling in 1931  Linus Pauling (1901-1994)  Slide  Definition of Hybridization.  Hybridization is the process of intermixing of pure atomic orbitals of slightly different energies and shapes to form new hybrid orbitals of same shape energy and shapes.  Slide  Salient features of Hybridization  The Hybrid orbitals have same energy and shape  The number of hybrid orbitals formed is equal to number of atomic orbitals intermixed.  The hybrid orbitals are more effective in forming stable bonds than pure atomic orbitals.  The hybrid orbitals are directed in space in some preferred direction to have stable arrangement.  Hybridization gives the geometry or shape of the Molecule  Slide  SP3, SP2, SP  SP3d, SP3d2 Hybridization  Slide  Hybridization of CH4 (Methane) - Hybridization of Carbon in CH4  Slide  Methane, CH4  C in ground state (z=6)1s22s22px12py12pz0  Here only two half-filled atomic orbitals.  So, in C in excited state  1s22s12px12py12pz1  That is, four half-filled atomic orbitals form four Hybrid orbitals intermix with 1S orbital of H (z = 1) 1s1 toform four C-H bonds located at corners of regular Tetrahedron. Bond angle is 109 281 or 109.50  28 minutes can be converted into degree. 28/60 = 0.4670 = 50  Slide  SP2 Hybrid orbitals  In ethene CH2 = CH2 has  SP2 Hybridization. One 2s, two 2p orbitals. 2px and 2py orbitals intermix to form three SP2 Hybrid orbitals known as SP2 Hybridization.    Slide  The conjugated structure of ethene. Schematic representation of sp 2... |  Download Scientific Diagram  Double bond = one sigma and one pi bond.  Slide  SP Hybridization  Acetylene or Ethyne  HC =C H  One 2s orbital and one 2px orbital intermix to form two SP hybrid orbitals known as SP Hybridization.  Slide    Triple bond = one sigma and two pi bond  Slide  PCl5 Hybridization - Trigonal Bipyramidal With sp3d Hybridization On BYJU�S  Slide  Hybridization  Thank you  Learn well. | Gaining the attention to objectives  Presentation of slides  Asking questions  Audio-video input  Developing the content.  Audio-video input entering into the content.  Asking question  Audio-video input giving picture of scientist.  Audio-video input giving  Postulates of  Hybridization  Audio-video input  giving more applications and problems  Presentation of slides  Audio-video input giving pictures of atomic orbitals and hybrid orbitals  Audio-video input giving  Shape of CH4 bond angle of CH4  Presentation of slides  Audio-video input giving more examples  Audio-video input giving more problems  Audio-video input giving  pictures of SP Hybridization  Presentation of slides  Evaluate and assess the content. | **Phase 1**  Establishes rapport with the students.  Confrontation with stage relevant task  Insisting to think  Give perceptual cues or hints  Elicits students’ responses  Seeks reasoning  Give perceptual Cues or Hints  **Phase II**  Inquiry  Probes reasoning  Seeks justification  Offer counter suggestions  Probes reasoning  Elicits students’ responses  **Phase III**  Transfer  Seeks justification results in Assimilation  Probes reasoning results in Assimilation  Insisting to think.  Offer counter suggestion results in Assimilation and then accommodation  Probes reasoning  Insisting to think  Seeks justification  Offer counter suggestion  Accommodation of new learning experience leading to ability to apply in different learning situations. |