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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 8**  Name of Teacher**:** Shanavas K.E Standard: XI Science  Subject: Chemistry Strength: 59  Topic: VBT, Directional properties and overlapping of Atomic orbitals Time: 6 minutes Chapter: Chemical Bonding and Molecular structure | | | |
| Audio | Video | Tg-Ig 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 9. Learn Chemistry in a simple way. Today we can study about valence bond theory, VBT directional properties of covalent bonds and the overlapping of atomic orbitals.  See the pictures of Hydrogen atoms forming H2 molecule  What does it indicate  See the picture 2  What does it mean  See the picture 3  What does it indicate  Who proposed VBT  What are the uses of VBT  What is positive overlap or in phase overlap.  See the picture  What is negative overlapping or out of phase overlap.  See the pictures.  What is zero overlap.  See the pictures  What is sigma bond and pi bind in overlapping of orbitals.  Can you define sigma bond  What is internuclear axis  Can you give example of sigma bond  What is pi (п) bond.  Which bond is strong, sigma or pi bond. Give the reason  What are the types of overlapping  What is s-s overlapping. Give an example.  What is s-p overlapping. Give an example  What is p-p overlapping. Give an example  See the pictures of pi bond  **Time gap online Assignment**  Identify the positive, negative and zero overlap formed when   1. Mixing Pz with S orbital 2. Mixing Px orbitals with Py orbitals | Teacher Presents  Slide  Topic  Slide  Picture I separate H atoms      No interaction between the H atoms  Approaching H atoms    Interactions begins  Bonded atoms  A bond is formed. H2 molecule is formed by overlapping of orbitals of H atoms. Greater overlapping, the stronger the covalent bond formed.    Slide  Heitler, London and pauling in 1927  VBT used to explain bonding and structure of molecule.   * Covalent bond is formed by overlapping of half-filled atomic orbitals.H+H=H2 * The strength of covalent bond is directly proportional to overlapping of atomic orbitals * Orbitals having the same energy participating in overlapping. * Direction of overlapping is equal to direction of bond and give the shape of the molecule.   Slide  Pz-Pz orbital.  Wave functions in the same directions and orientations.  The same phase overlapping is known as positive overlapping    Slide  The different phase overlapping is known as negative overlapping. The same orbitals Pz in same orientation and different phase. Hence negative overlapping.    Slide  The different orbitals are out of the phase due to different orientation. Direction of approach. This overlapping not help in the formation of bonds. Hence zero overlapping.    Slide  Sigma bond denoted by the letter σ. Head on overlap or Axial overlap.  Slide  Definition  Sigma bond is defined as the when two half-filled atomic orbitals overlap along inter nuclear axis.  The line passing through the centers of nuclei of the two atoms is called internuclear axis  H**\_**H bond overlapping  Here S orbital of one H combine or overlap with S orbital of another H atom along internuclear axis. Hence it is sigma bond.  When two half-filled atomic orbitals overlap perpendicular to internuclear axis, the bond formed is pi bond.  Sigma bond is strong due to maximum overlapping. It is single bonded atoms.  Pi bond is weak due to minimum overlapping.it contains double bond and triple bond    Slide  s-s, s-p and p-p overlapping.  The mutual overlap of the half-filled s orbitals of H atoms is known as s-s bond.  Eg. H2 molecule overlapping  The bond formed is sigma bond.  When half-filled S orbital of one atom overlap with half-filled P orbital of another atom to form S-P overlapping.  Eg. H-F molecule Here S-Pz here the bond formed is sigma bond  When two half-filled P atomic orbitals overlap to form p-p overlapping  Eg: F-F molecule  Pz-Pz orbitals here formed is also sigma bond.  Px-Px, Py-Py half-filled atomic orbitals overlap perpendicular to internuclear axis form п bond.      Slide  a) Positive and Negative overlap  b) Different orbitals  Px-Py orbitals  No overlap  Slide  Thank you  **Enjoy and learn chemistry**. | .  Gaining the attention to the objectives  Presentation of Slides  Audio-Video input  Asking questions  Developing the content  Audio-Video input entering into the content  Audio-Video input giving more examples  Presentation of slides  Audio-Video Input giving more applications or problems.  Asking questions  Audio-Video Input  Audio-Video input giving more examples  Presentation of slides  Audio-Video Input  Audio-Video input giving more applications and problems.  Audio-Video Input  Evaluating and assessing the content | **Phases I**  Establishes rapport with the students  Confrontation with stage relevant task  Insisting to think  Elicits Students responses.  Giving perceptual cues or hints.  **Phase II**  **Inquiry**  Elicits students’ responses  Probes reasoning  Seeks justification  Seeks justification results in assimilation.  Offer counter suggestions.  Probes reasoning  **Phase III**  **Transfer**  Elicits students’ responses  Giving perceptual cues or hints.  Elicits students’ responses  Seeks justification  Elicits students’ responses  Insisting to think  Probes reasoning results in assimilation  Accommodation of new experience leading to ability to apply in different learning situations.  Offer counter suggestions results in assimilation and then accommodation |