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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 |

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| 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 11 Learn Chemistry in a simple way. We can Learn about MOT and energy level diagram for MOT’S  Who proposed MOT?  Can you give the salient features of MO’s Theory,    What is BMO  What is AMO  What are the types of molecular orbitals  What is σ M. O’S  see the Diagram  What is п MO's  What are the possibilities of orbitals formed by addition and subtraction of 2S orbitals and 2Pz orbitals.  What types of M. O’S formed by mixing 2Px 2Py atomic orbitals.  Can you give energy sequence For **B2, C2 , N2**  σ2Pz M.O has higher energy than π2Py. Give the reason  Can you give energy sequence for **O2, F2, N2**  Why σ2Pz M.O has lower energy than π2PY  Draw the energy level diagram for O2 molecule. Give its Energy sequence calculate bond order for O2 and magnetic nature  **Time gap online Assignment**  Gives the energy sequence of N2+ molecule. Calculate bond order and magnetic nature.  Draw the energy level diagram for N2 molecule ion | Teacher Presents  Slide  Topic    Slide  Hund and Mullickan    Slide  Main Postulates   * The number of M.O’s formed is equal to the number of atomic orbitals combined. Bonding Molecular Orbital (BMO) and Anti bonding molecular orbital (AMO) are formed. * Like atomic orbitals, the molecular orbitals are filled in accordance with Aufbau, Pauli’s exclusion principle and Hund’s rule   Slide  Definition  BMO is formed by addition of atomic orbitals which has lower energy than combining orbitals. It favors bond formation    Slide  Definition  AMO is formed by subtraction of atomic orbitals which has higher energy than the combining orbitals. It opposes bond formation    SLIDE  Sigma Molecular orbitals σ M. O’s  Pi Molecular orbitals π M. O’s  Slide  Definition  σ M. O’s is formed by overlap of atomic orbits along inter nuclear axis. Overlapping is maximum. Strong bond. One electron cloud. Symmetrical around the Inter nuclear axis    Slide  Definition  Π M. O’s formed by sidewise overlap of atomic orbitals. Overlapping is weak. Two electron cloud. Not symmetrical around inter nuclear axis  Slide  possible sigma M O   * 2S orbitals form σ2SBMO and σ\*2S AMO * 2pZ orbitals form σ2Pz BMO and σ\*2Pz AMO   Slide  possible Pi M.O orbitals  2Px , 2Py orbitals sideways overlap to form πbonds.  π 2Px=π2Py BMO and π\*2px=π\*2Py AMO’S  Slide  Energy sequence    Slide  It is due to orbital mixing effect. Here the energy difference between 2S and 2P orbital is very small. Mutually interact and combine known as orbital mixing effect. That is σ2S orbital is lowered at the cost of 2Pz orbital which is raised  Slide  Energy sequence    Here energy difference between 2S and 2P orbitals is quite large  Slide  Axial overlapping is stronger than sidewise overlapping  Slide  O2 molecule = 8+8 =16 electrons. The energy sequence is    The unpaired electron indicates paramagnetic nature  Bond order means double bond  Slide  Energy sequence of N2 molecule  The energy sequence is    Slide  Energy level diagram for N2 molecule ion    Slide  **Thank you**  **Learn well** | .  Gaining the attention to the objectives  Presentation of Slides  Asking questions  Developing the content  Audio-Video input entering into the content  Audio-Video Input giving pictorial representation of symbols of sigma and pi molecular orbitals  Audio –video input (pictures of BMO AND AMO)  Presentation of slides  Audio-video input giving more applications and problems  Asking questions  Audio- video input  Presentation of slides  Evaluating and assessing the content  Audio-video input  Assessing the content with more applications and diagrams | **Phases I**  Establishes rapport with the students  Confrontation with stage relevant task  Insisting to think  Elicits Students responses.  Giving perceptual cues or hints.  Elicits students’ responses  **Phase II**  Inquiry  Seeks justification  Probes justification results in assimilation  Offer counter suggestions  Insisting to think  Probes reasoning  **Phase III**  Transfer  Insisting to think  Elicits students’ responses  Seeks justification results in assimilation and then accommodation  Offer counter suggestion results in assimilation and then accommodation  Probes reasoning of new experience results in assimilation and accommodation |