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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: VSEPR Theory and its Shape 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. Students, can you predict the shape or structure of Molecules.  Can you give the expansion form of VSEPR theory.  Who proposed VSEPR theory  What are the main postulates of VSEPR theory.  Can you give the structure of Methane. Using methane, CH4, we can easily study the main postulates of VSEPR theory.  Can you give the postulates of VSEPR theory.  Can you predict the shape of molecule, if the central atom has only bond pair of electrons  What is the shape of the molecule if Bp is 2  Can you give example of the molecule if Bp is2  What is the shape of the molecule of the Bp is 3  Can you give example of the molecule if Bp is 3  What is the shape of the molecule if the Bp is 4  Can you give example of the molecule if Bp is 5.  What is the shape of the molecule if the Bp is 6  Can you gives example of the molecule if Bp is 6  What is the shape of CH4, NH3, and H2O  Can you give the bond angle of methane, CH4  Can you give the shape and bond angle of NH3.  Can you give the shape and bong angle of H2O  Can you predict the shape of PCl5 and SF6  PCl5 lewis structure, molecular geometry, hybridization, bond angle  What is the shape of SF6  What is the hybridization of SF6? | Homework.Study.com  **Time gap online Assignment**  Axial bonds are longer than equatorial bonds in PCl5. Explain | Teacher Presents    Slide  The shape of the covalent molecules or compounds can be predicted by a theory known as VSEPR theory.  Slide  Valence Shell Electron Pair Repulsion Theory.  Slide  Sidewick and powell in 1940.  Slide  Structure of methane  Explain the bonding in methane molecule using electron dot | KnowledgeBoat  In the three-dimensional structure of methane, CH4, where are the hydrogen  atoms attached to a carbon atom aligned? | Socratic  Hydrocarbon - Structures, Bonds, Compounds | Britannica  Tetrahedral shape  In CH4, carbon has 4 valence electrons. It shares with + atoms to form 4 C-H bonds. The four bond pairs located at corners of tetrahedron in 3-dimensional space. The four bond pairs are in minimum repulsion.  Slide   1. The shape of the molecule depends upon the number of valence electrons around the central atom, whether bonded pair and lone pair of electrons 2. Electron pair try to stay as far apart as possible to acquire a state of minimum energy and maximum stability. 3. The repulsive interaction decreases in the order Lp Lp > Lp bp > bp bp 4. The presence of Lp in addition to Bp will result in the change of the shape of the molecule. 5. The repulsive force decreases with increasing bond angle between electron pairs. They are strong at 90, weaker at 120and weakest at 180   Slide  Slide    Linear  BeF2, BeCl2  Triagonal planar  BF3, A1Cl3  Tetrahedral shape  PCl5  Octahedral shape  SF6  In CH4, carbon has 6 valence electron shares its electron with 4 Hydrogen atom to form 4 C-H bond pairs. The shape of CH4 is tetrahedral.  Slide  The bond angle of CH4 is 10928’ or 1095  28’/60=0.467  All C-H bonds are in minimum repulsion. It located at the corners of regular Tetrahedron.  In NH3, N has 5 valence electrons. Out of 5, three electrons of N shares with 3 H atom to form 3 N-H bonds. 3 Bp + 1Lp. The shape expected is Tetrahedral (total four electron pairs) but actual shape is pyramidal due to one lone pair. Bond angle of NH3 is 107    Slide  In water, H2O oxygen has six valence electrons, it shares two electrons with two 2 H atom. (2 Bp + 2 LP) the shape of H2O is V shape or Bent shape due to presence of 2 lone pair electrons in water. The bond angle of water is 104.5.  H2O Lewis Structure - Drawing Method of H2O Lewis Structure, Molecular  Geometry of H2O, Polarity and Hybridisation in H2O molecule, with FAQs    15.1: Structure of Water - Chemistry LibreTexts  15.1: Structure of Water - Chemistry LibreTexts  Slide  In PCl5, the central atom P has 5 valence electrons, it shares with 5 chlorine atoms to form five p-c1 bond pairs. The shape is triagonal bi pyramidal. The bond angle is 90  The hybridisation in P{Cl}_{5} molecule is:{ sp }^{ 3 }{ sp }^{ 3 }{ d }^{  2 }{ sp }^{ 3 }d{ sp }^{ 2 }    Slide  S has six valence electrons. It shares with six F atom to form six S-F bond pairs. The shape is octahedral bond angle is 90  Inorganic Molecules: A Visual Database  Slide  Structure of PCl5. Triagonal bipyramidal shape. Bond angle is 90Three p-cl bonds in one plane or corners of equilateral triangle are equatorial bonds while two p-cl bonds perpendicular to plane are Axial bonds. Axial bonds are longer than equatorial bonds is due to more or greater repulsion from the equatorial bonds. Hence axial bond is longer bond length.  Slide  THANK YOU  LEARN WELL | Gaining the attention to the objectives  Presentation of Slides  Asking questions  Audio-Video input  Developing the content  Audio-Video input entering into the content  Audio-Video Input giving main postulates  Audio-Video Input  Audio-Video input  Developing the content  Audio-Video Input giving more applications or problems.  Audio-Video input giving equations  Audio-Video Input giving more applications or problems.  Audio-Video Input giving equations  Asking questions.  Audio-Video input giving more examples  Presentation of slides  Asking questions.  Audio-Video input  Evaluating and assessing the content  Audio-Video input  Audio-Video input giving more examples | **Phases I**  Establishes rapport with the students  Confrontation with stage relevant task  Presents a puzzling problem  Insisting to think  Giving perceptual cues or hints.    **Phase II**  **Inquiry**  Elicits Students responses.  Insisting to think  Offer counter suggestions  Seeks justification  Probes reasoning  Seeks justification results in assimilation  Offer counter suggestions  Elicits students’ responses  Accomodation of new experience leading to ability to apply in different learning situations  **Phase III**  Transfer  Probes reasoning  Insisting to think  Seeks justification results in assimilation  Accommodation of new experience leading to ability to apply in different learning situations. |