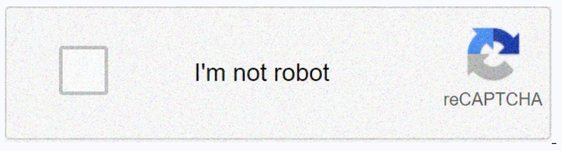

SUBMIT

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b) Answer any two of the following: **[4]**

i) Give any two conditions for the ideal wash liquid.

ii) Calculate the solubility of $BaSO_4$ in water, if its solubility product is 1.41×10^{-10}.

iii) A 1.5×10^{-4}m $CuSO_4$ solution shows an absorbance of 0.83 at its maximum wavelength. Calculate the concentration of unknown $CuSO_4$ solution if it shows absorbance of 0.23 under the identical conditions.

Q3) Answer any two of the following: **[10]**

a) What is gravimetric analysis? Explain the conditions for good precipitation.

b) Explain the various types of spectrophotometric titration curves with suitable example.

c) Discuss the qualitative applications of polarography.

Q4) a) Explain the principle of TGA. Deseribe a TGA curve for decomposition of hydrated calcium oxalate. **[6]**

OR

i) Write a note on photovoltaic cell. **[3]**

ii) Explain the quantitative applications of AAS. **[3]**

b) The diffusion coefficient of Cd^{2+} having concentration 3×10^{-3} moles/lit is 0.72×10^{-5} cm^2/sec. If the capillary characteristic are t = 4 sec and m = 3mg/sec. Calculate the diffusion current for Cd. **[4]**

OR

Calculate the solubility of PdI_2 in water in grams per litre and in gram mole for lit if its solubility product is 1.12×10^{-11} at 25 °C Molecular weight of PbI_2 is 462. **[4]**

× × ×

MAHARSHI DAYANAND SARASWATI UNIVERSITY, AJMER

PROGRAMME OF EXAMINATION – 2018

B.Sc. Part – I (10+2+3) Examination of Three Years Degree Course & Honours Part - I (Three Years Scheme) Compulsory & Subsidiary Subjects

Day & Date			Time	Subject	Paper
Thursday	22	Feb. 2018	7AM to 10AM	Geology	I
Saturday	24	Feb. 2018	7AM to 10AM	Geology	II
Tuesday	27	Feb 2018	7AM to 10AM	Geology	III
Monday	05	March, 2018	7AM to 10AM	Physics / Botany	I
Wednesday	07	March, 2018	7AM to 10AM	Physics / Botany	II
Friday	09	March, 2018	7AM to 10AM	Physics / Botany	III
Monday	12	March , 2018	7AM to 10AM	Chemistry	I
Wednesday	14	March 2018	7AM to 10AM	Chemistry	II
Friday	16	March 2018	7AM to 10AM	Chemistry	III
Saturday	**24**	**March 2018**	**7AM to 10AM**	**Gen Hindi**	

Tribhuvan University

Institute of Science and Technology

Three Year B.Sc. Chemistry course of study

(2065)

Course title: Basic Chemistry I — **Full Marks**: 100
Course No.: CHEM 311 (major/minor) — **Pass Marks**: 35
Nature of the course: Theory — **Year**: I

Course Objectives:

The outcome of this course will be:

- To stimulate, create and sustain their interest in the study of chemistry.
- To provide a body of chemical knowledge appropriate for higher studies.
- To make aware the importance of scientific method of accurate experimental work.

Group A: Inorganic Chemistry

Atomic structure:- Bohr's theory and refinements, wave mechanical model of the atom, matter waves, de Broglie's equation, Heisenberg's uncertainty principle, Schrödinger's wave equation (time independent), physical significance of wave function, probability density pattern for hydrogen atom, radial and angular wave functions, radial distribution curves, shapes of s, p, d orbital ; charge cloud diagrams and boundary surface diagrams, nodal planes, quantum numbers and their significance, energy level diagram. 10 hrs

Multi-electron system:- Pauli exclusion principle, Hund's rule of maximum multiplicity, Aufbau principle and its limitations, energy level diagrams, stability of completely filled, half filled and empty orbital. 3 hrs

Nuclear Chemistry:- Composition of nucleus (nuclear stability), binding energy, radioactivity, half life determination and nuclear reactions. Group displacement law and radioactivity series. 4 hrs

Periodic classification of elements and physical properties:- Periodicity of elements, s, p, d and f blocks, long form of periodic table, discussion of properties like atomic, ionic and covalent radii, ionization potential, screening or shielding effect, electro negativity, different scales of electro negativity measurements (Pauling, Mulliken and Allred and

Paper II: Drama

Duration: 3 hours **Max Marks: 50**

Syllabus

Play prescribed for detailed study: George Bernard Shaw: *Arms and the Man.*

Play prescribed for non-detailed study: Mahesh Dattani: *Where There's a Will*

Note: Passages for explanation will be set from *Arms and the Man* only.

Pattern:

The paper will be divided into three units. Unit I will consist of six passages from *Arms and the Man* out of which candidates will be asked to explain any three with reference to the context. Unit II will consist of four questions on *Arms and the Man* and candidates will be asked to answer any two questions. In Unit III out of four questions on *Where There's a Will* candidates will have to answer any two questions.
(Unit I will carry 18 Marks and Units II and III will have questions of 8 marks each.)

Paper III: Prose and Fiction

Duration: 3 hours **Max marks: 50**

Syllabus

Detailed Study: *An Anthology of English Prose* edited by the Dept. of English & MEL, University of Allahabad, Macmillan.

The following essays are prescribed:

1. E. V. Lucas: "Tight Corners"
2. A. G. Gardiner: "In Defence of Ignorance"
3. Robert Lynd: "Student"
4. G. K. Chesterton: "On the Pleasure of No Longer Being Very Young"
5. George Orwell: "Reflections on Gandhi"
6. Aldous Huxley: "Pleasures"
7. J. B. Priestly: "On Doing Nothing"
8. Bertrand Russell: "The Road to Happiness"
9. Richard Wright: "Twelve Million Black Voices"
10. A. C. Benison: "The Art of the Essayist"

The following novel is prescribed for detailed study:

George Orwell: *Animal Farm*

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Âtem id itipmeir p2 ilatibro eud ehcna onos iC .enoizarugifnoc id iremosi emoc ehcna eretsise onossop ivitutitsos inaclaolcic I .assab ¹Âip enoizaremun al ah acitebafla Ātiroirp noc etneutitsbus li ,anetac alled Ātimertse el ebmartne ad ilaugu eznatsid a itneutits-bus isrevid eud onos ic eS .enimma e idimma ,icilissobrac idica ,ilonef ,ilocla onos onegordi id enoizaicossa'lla erapicetrap onossop ehc inumoc ilanoiznuf ippurg I .icitamora o icitafila emoc itacifissalc eresse onossop icitafila ilanoiznuf ippurg I ICITAMORA IPPURG E ICITAHPILA 2C ilanoiznuf ippurG â C enoizeS .agnul ¹Âip anetac alled enoizaremuN .iralocitrap oinobrac id imota eud art itazzilacol onos non ©Âhciop ocitamora ollena'lla onrotni itazzilacoled onos Ï inorttele ies i e lac -irtemmis ¨Ã eralocelom elatibro'L .41 .lana- ossiffus lad itacifitnedi onos)lanacla o(idiedlA .omota ingo ad 3 ps otipmeir Ātem a itadirbi ilatibro id enoizisopparvos allad etamrof onos oinobrac e imota itseuq art inoizagilbbo eL .ogoul omirp ni eneivva enoizadirbi'l ©Âhcrep onageips ehc Ï imagel itrof eramrof id itadirbi ilatibro ilged Āticapac al Ã .giF(imagel ippod ia ottepsir ilognis imagel ihgnul ¹Âip noc otamrofed ebberas ollena'l ,attase arutturts atseuq esseva enezneb li es e imagel ilognis ied itroc ¹Âip onos imagel ippod i ,oipmese dA .animmalite)b ;animmalitem)a(.itarapes eresse onossop non e alocelom assets alled esrevid emrof onos ivitamrofnoc iremosi ilG .eretid)b( )a(representation of benzene a a a delocalization. This means there are two atomic orbital shells available for these electrons. Note that a Benzylic group consists of an aromatic ring and a group of methylene (Fig. Both of these functional groups are always at the end of the main chain and should not be numbered (Fig. 1C). The remaining sections can be used in any order. Carbon is in the second line of the periodic table and has six electrons that will be held on lower atomic orbitals of energy before entering orbital higher energy (Aufbau Principle). If the substitutes are on the same side of the ring, the structure is deceased as cs. A solitary pair of electrons occupies one of the SP orbitals, but the other SP orbital can be used for a strong bond ï. This determines the form of functional groups. 24). Therefore, alcohol (Fig. When orbital equal energy is available, the electrons will occupy separate orbitals before mating (Hund rule). A bond between a hybrid carbon atom SP 3 and a hydrogen atom involves carbon atom Using one of its SP 3 orbital by ï? connected together to form a ring. The hydrogen bond involves the partially charged hydrogen of a molecule (the bond donor H) that interacts with the partially loaded heteroatom of another molecule (the adjoining H bond) (Fig. the remaining 2P orbital (in this case the 2PY Orbital) remains at its original energy level (Fig. This is known as SP 2 hybridization; â— 2S orbital is mixed with one of the 2p orbitals. Ortho, destination and paragraph of an aromatic ring. This compression compression of the bond angles is due to the O RBItal containing the solitary pair of electrons, which requires a slightly greater amount of space than a bond. Tioli and tioli are appointed by adding sufi tioleName of the alcan parent (Fig. 9b is called 1-cyclohexyloctane and non-ottiliccyclohexane. The position of substitutes is determined by the numbering around the ring, or in the case of disostituted aromatic rings, vegetable garden, meta, para nomenclature. H3N C O R O H3N C O R O H3N C O R O Fig. The delocalization takes place in married systems where individual and double ties alternate (e.g. 1,3-butadiene). a) 2,4,6-Trinitrotoluene; (b) 2-chloro-1,4-dinitrobenzene. 13. 28 Section C – Functional groups ● Functional groups that contain nitrogen (Fig. Of course, one of the main problems in subject study is the large amount of material that often needs to be covered. Therefore, the 2px, 2py and 2pz atomic orbits are assigned (Fig. The following examples (Fig. van der Waals interactions are also important for alkynes, alkynes and aromatic rings. 2p orbitals are handlebars in shape and can be assigned 2px, 2py or 2pz depend- ing on the axis along which they are aligned. The hybridized sp orbitals occupy the space left above and are in the x axis pointing in opposite directions (only the main lobe of sp orbitals are shown in black; Fig. Electrons move continuously unpredictablely around any molecule. However, alchenes that have several substitutes at both isomerism ends of the double bond can exist as two possible isomers. Formation of ethanamide. Ethyne. The main chain must include the functional group and the numbering is such that the functional group is at the lowest possible number. The types of reactions that the compounds suffer are determined by the types of functional groups that are present. For example, there are two configurational issomers of 1,2-dimethylcyclopropane depending on whether the methyl groups are on the same part of the ring or on the opposite sides (Fig. 56. Although the charges are very weak and fluctuate aroundare strong enough for ippurg I .acidoirep allebat alled 2 alif ni ¨Ã de inorttele ies ah nobraC NOBRAC icimota ilatibro ilged CIMOTA ARUTTURTS 1A oiggallocni e arutturtS â A enoizeS .giF)aHS 2HC3HC .giF(onegisso onognetnoc ehc e imagel ilognis onoglovnioc ehc ilanoiznuf ippurg â ;)3 .inorttele eud eneitnoc emagel ingo ehc emoc itaiggennad non inorttele odnedividnoc ortla'l noc onu'l imagel eramrof onossop enoizadirbi id imota iIG .ocilitem oppurg nu ¨Ã de olonatem lad eneivorp lihcla oppurg II .oiradnoces oinobrac id ortnec nu eneitnoc)2HC(enelitem id oppurg nU .7 .ortla'lled ednarg ¹Âip otlom obol nu noc itamrofed irbunam onos ps itadirbi ilatibro ilg ertnem amrof ni irbunam onos p2 ilatibro ilG airtemoeG . Ātilibats eroiggam anu ehcna atropmoc enoizazzilacoled atseuQ).2D cipoT(emagel oippod led acimihcoerets al erinifed oirassecen ¨Ã inihcla inucla inihcla noC .giF(elanoiznuf oppurg la otaccatta etnematterid ocitamora ollena ¨Ã iv non iuc ni onu ¨Ã icitafila ilanoiznuf ippurg id oppurg nU .21 .irutasni eretse-²Ï,±Ï)b(;enotehc detarutasnI-²Ï,±Ï)a(.de dn2â.kcirtaP L.G / acinagro acimihC .11 .imagel eud eramrof ebbervod oinobrac li ehc acilpmi ocimota oinobrac led acinorttele enoizarugifnoc aL .otasu etnemenumoc arocna ¨Ã de senekla id E arutalcnemon alled enoizarugifnoc id iremosi ilged enoizacifissalc id odotem oihccev nu ¨Ã senekla rep snart arutalcnemon al e sic aL e Z â seneklA .yrarbiL hsitirB al osserp elibinopsid ¨Ã orbil otseuq rep PIC ogolatac nU).emeisni acifingis ehc 'nemmasuz' acsedet alorap allad(Z emoc otangised ¨Ã enekla'l ,emagel oippod led etrap assets allad onos iratiroirp ippurg eud i eS .giF C)a C 3psdnob amgis 3ps + C .giF ni otartsom emoc otacifilpmes eresse ²Âup e a4 .oiranretauq ortnec nu ¨Ã itneutitsos orttauq noc oinobrac id omota nu ertnem oiraizret oinobrac id ortnec nu eneitnoc)HC(enihtem oppurg lI .adneciv a onoggartta is esrevid elocelom ni atsoppo acirac id inoiger evod ,elocelom art enoizaretni elobed anu can affect the reactivity of a functional group if they are .itneutitsottos id oremun li eratneserppar rep itazzilitu onos aretec te ,-artet ,-irt ,-id issiferp i ,icitnedi itneutitsottos ah arutturts anu eS .amrof ni eraenil Āras emagel li rep ps ilatibro eud i azzilitu ehc alocelom anU .idifluslihclaid emoc itacifitnedi eresse onossop icilpmes itned I .ilibissop aro onos inoizagilbbo orttauQ .elapicnirp anetac alled enoizacifitnedI ?aniraf o aniore ¨Ã â attircsed non acnaib erevlop anu erazzilana aredised ehc esnerof otaizneics ol Āretuia .eiranretauq o eiraizret ,eiradnoces ,eiramirp onais ehc adnoces a erairav onossop ippurg itseuq id enoizavittair el e Āteirporp el otnauq ni etnatropmi eresse ²Âup odom otseuq ni ilanoiznuf ippurg i eracifitnedI .giF)c)b)a 3HC 3HC H C C H 3HC H H C H H H H H H H H 3HC li ,emagel oippod led itsoppo ital ius onos iratiroirp ippurg eud i eS .)elanaclaolciclihcla ¨Āoic(ocilihcla etneutitsos nu ¨Ã onacla oppurg li e erotineg ametsis li otaredisnoc ¨Ã onaclaolcic li ehc elat itamaihc etnematilos onos onacla nu da itagel inaclaolcic I .loocla Đ3)f(;loocla Đ2)e(;loocla Đ1)d(;lihcla id orumorb Đ3)c(;lihcla id orumorb Đ2)b(;lihcla id orumorb Đ1)a(.itadirbi itats onos otoza'l ehc oinobrac li ais evod)NµÎC(elirtin oppurg nu id onretni'lla emagel li erageips rep atasu eresse ²Âup airoet assets al etnemattasE ilirtin id ippurG .etnemlicaf ¹Âip ottor eresse ²Âup e Ï emagel nu id elobed ¹Âip ¨Ã Ï emagel li ©Âhciop ivittaer onos Ï imagel onognetnoc ehc Ātivittaer id ilanoiznuf ippurg I .12 .enotehc o animma anu ,loocla nu emoc iralop ilanoiznuf ippurg eneitnoc es olopid otnemom nu Ārva e eralop Āras alocelom anU .elanoiznuf oppurg leuq rep ossiffus ovitaler li odnegnuigga atacidni ¨Ã ilanoiznuf ippurg id azneserp aL .)61 .oinobrac noc Ï emagel len otazzilitu eneiv ehc ps elatibro nu ah otoza'L .03 .)itareneged onos ¨Āoic(aigrene irap onnah p2 ilatibro ilG .elanoiznuf oppurg led onretni'lla acinorttele Ātisned al erazneulfni e odnanod -enorttele o ¹Âip ¹Âip ¨Ã Ï emagel nu ©Âhciop ,inacla ilged ivittaer ¹Âip onos ihcla ilg ©Âhcrep ehcna ageips Ï emagel nu id azneserp broken and it is more likely to take part in the reactions. Preface 9. the orbital was ï¬led and two of the orbitals were half. a4 â€ “SP 2 hybridization 13 electrons. Therefore, there are a total of atomic orbitals in which these six electrons can be ï. Many students whiten the prospect of having to learn a seemingly endless number of reactions and when it comes to drawing mechanisms and arrows curly, they only see a confused labyrinth of disgusting lines that go anywhere but nowhere. are oats for identical substitutes, but the order in which they are written still depends on the alphabetical order of the substitutes themselves (i.e. ignore the di-, tri-, tetra-, et cetera.) however, there is another rule that could have precedence over the rule above. © garland Science/BIOS scientific publishers, 2004 for the first time published in the 2000 second edition published in 2004 all rights reserved. 3 is 4-etil-3-methylocthan and not 3-methyl-4-ethylene. lbo minor majors lobo fig. related topics related to covalent bond and hybridization (a2) bonds and hybrid centers (a6) electronic conguration nitrogen, oxygen and chlorine sigma bonds deceometry 15. the energy of each hybrid orbital is greater than the original but lower orbital p. 18. â— Linear functional groups - alkyne, nitrile. 9c is called 1-etil-3-methylene instead of 1-methyl-3-etylcyclohexane or ï- each of the hybrid orbitals according to the hund domain so that they are all half-way. Therefore, the 2py and 2pz orbits of each carbon atom can overlap laterally to form two bonds ï € (fig. if the bonds ï were the only bonds present in ethens, the molecule would not remain flattened since the rotation could occur around the câ € "C ï ` bond (fig. 47). c o h h h c o h sp2 a) sigma bondsp2 fig. for example, by connecting ethanic acidDâ Etanamide (Fig. Alcheni and Alchini died by adding the sufãorth and -yne respectively .yne. Considering the atoms alone, the nitrogen forms a pyramidal shape in which the corners of the bond are slightly lower than 109.5 ° å ¡(C. (A) formation of a Butano (C4H10); (b) 2- mettypropano (C4H10). Just because carbon form Four ties? For example, alcohol (fig. I. 15). ã ¢ â € "Hydrogen uses a 1S orbital for the link and is not hybridized. In the A1 topic that a bon atom car has two Electrons passed off and therefore expect us We would see that carbon will form two ties. These correspond to a hydrogen for the methyl substituent and a carbon for the ethyl substituent. For example, 1-BULTENE (Fig. Key notes the alkans are organic molecules made up exclusively of carbon and hydrogen atoms connected by individual bonds ãhorto ’’. CCR2) have a hybrid carbon SP located at the center of two double bonds, but these functional groups are beyond the purpose of this text. Alchini are linear molecules and are reactive due to the reactive to the ome ties. Molecular orbeds for hydrogen (H2) . The use of these three orbitals in the bond explains the shape of an alchene, for example ETENE (H2Cã 22). Constitutional isomers are isomers in which atoms are connected together in a different o etnof anu ad onouges ehc acinagro acimihc id isroc ieuq a inumoc eresse id Ātilibaborp iroiggam onnah ehc esab id itnemogra us artnecnoc is orbil II .ilanoizarug iremosi eretsise onossop inaclaolcic e itiutitsos inehclA .giF(etneutitsos nu otaredisnoc ¨Ã ocinimma oppurg li e onacla nu ¨Ã emon led)ecidar o(elapicnirp etrap al otnauq ni irete de icilihcla irunegola ilga elimis ¨Ã enimma el rep arutalcnemon aL enimmA .onegordi id omota nu e 3 PS otadirbi oinobrac nu art o 3 PS itadirbi inobrac eud art itamrof imagel itrof onos)Æ¯Ã(amgiS imagel I .¬â ¯Ã emagel la etrap erednerp onegordi nu rep elibissopmi idniuq Ã .)onaseolcic(orbmem ollenA -ies li ¨Ã otartnocsir etnemenumoc ¹Âip onaclaolcic li ,aivattuT .GIF O2H- + O C 2HN C3H O C HO C3H3HN .iratiroirp ippurg ied evitaler inoizisop elled adnoces a e o z emoc itangessa eresse onossop inehcla ilG .itsoppo irig ereva onoved inorttele itseuQ aremun anetac al enif elauq ad erediced osrevid ¯Ã ,erutturts enucla nI .itneutitsos irtla itneserp onos es irotineg ied imon emoc otasU .¬â inorttele id enoizazzilacoled al isracifirev onossop is iuc ni erutturts ehcinu el onos noN .lona- x ¬Â¯Âfus itaguinoc icitamora illena ilga itartsinimmos onognev)ilonacla o ?¯Ã ozzem a p2 ilatibro eud e dlar¯Ã ozzem a PS ilatibro eud a atrop ²ÃiC .giF(icilocla ilanoiznuf ippurg i art onegordi emagel li elibissop ¨Ã ©Âhciop etneibma arutarepmet a odiuqil nu ¨Ã olonatem li ,oirartnoc lA .elapicnirp anacla anetac alled etneutitsos nu otaredisnoc ¨Ã elanoiznuf oppurg li otnauq ni imase itnedecerp iad asrevid etnemreggel ¯Ã itsopmoc itseuq rep arutalcnemon aL lihcla e iretE .agnul ¹Âip anetac al oremuN)b(;agnul ¹Âip anetac al eracifitnedi)a(.isrevid itsopmoc onos e krowemarf General chemistry course. Related topic of covalent and hybridization bond (A2) Electronic Energy Congraction atomic energy levels 1S 2S 2S 2px 2pz 2pz y xz y xz y xz y xz xz sfrig. Herthical portion Metil Group H3C or C or CH3 Metithaleic Acid + Oh CH3C H3C OH C O FIG. Figure 7 represents the ties ãhorto ’of HCN as lines and how the remaining orbitals are used 2P to form two ties ãsto âvelop. Now we are ready to look at the bond of a hybridized carbon sp 2. a4 â ¢ â,¬ â € œIbridazione sp 2 9 deãorth -nition in SP 2 hybridization, the orbital is mixed with two of the 2P orbitals (For example 2px and 2pz) to give three hybridized orbital orbeds of equal energy. However, these topics are the foundations of the topic and once they have been grasped, the general picture becomes clear. Alcohol (fig. "To buy your copy of this or any of the collection of E -books of Taylor & Francis or Routledge, go to www.ebookstore. 7) Show how the oxygen Valenza electrons are arranged After the hybridization SP 2. Key. Note the functional groups have deceased as alifhetics if there is no aromatic ring directly attached to them. The guerational isomers are replaced and replaced the cyclists in which the substituents are arranged in a different way there 'One to the other. Fig. 3-Metil-2-Botanone can actually be simplified (Fig. 40. Methylic groups can be on the same side of the double bond (the isomer cis; fig. van der Waals van Der Waals The interactions are the weak interactions of the intermodular bond interactions and involve the transitory existence of Paid Rtiali in a molecule. That energy difference receipt the mixing of the respectful atomic orbitals. 8. For example, groups was national containing Trigonal Planars SP 2 They are pieds while the functional groups that contain SP centers are linear: â— Functional groups â € "Aldidoid, Cherone, Alkene, carboxylic acid, acid chloride, acid anhydride, foreign, amid, aromatic anhydride. There is a complication that involves foreign and amido. For carbon, each SP 2 hybridized orbital contains a single unre -printed electron. 11b to represent this relocation of the ï € 12 section a â € "structure and gluing h h h h h h h h h h h h b = a) Fig. When more of two sub -aring are present on the aromatic ring, the vegetable garden, the goal, the nomenclature para is not More valid and the numbering must be used (Fig. 2a), the long chain is made up of five carbon atoms and a Pentane chain; â— number the long chain of the coal, starting from the end of the point of the branch (fig. 7b) from 5ï © 3 = 11 is less than 5. The orbitals 1 and 2 are spherical in shape. Definition (B1) Simple Alcane Ramified Alcane CycleAlkanes Multi-Branched Alkanes Cicanealkanes CicloAlkanes Multi-Branched 32. All atoms are carbon and hydrogen and all ties are câ € "C and câ €" h. ALCOLCHI AND ALCHIL Halogenuri; a) primary; b) secondary; e) tertiary. Intermolecular ionic connection of amino acids. â— All aromatic coal must be 2 hybridized. The alkan, more isomers who are possible. An understanding of organic chemistry helps the chemist or chemical engineer of the Indust-di Test in front of unexpected collateral reactions in a chemical process, and the agro-scientist trying to understand the molecular processes that take place inside plants and crops; And contribute to the design and synthesis of new herbicides and fungicides that will be eco-friendly. C o o h3c c o o co nH c o h3c c n o ch3 ch3 a) b) c) Fig. The functional group is numbered and called as a replacement (fig. Gray. A) representation of the aromatic ring; b) structure Ã «deformed» resulting from bonds 24 Section B – Alcani andH3C CH3 CH2CH3 H3C CH3 CH2CH3 5 10 1 2 Fig. One is more stable than the original atomic orbitals and is called the binding MO. The structures are different compounds with different chemical and physical properties. The orbital 2 is next in energy and the 2p orbitals have the highest energies. Alkynes Consider the bond in etino (Fig. The remaining sp orbital on each carbon is used to form a strong carbon-carbon bond σ. 1. Polar molecules that can dissolve in water are called hydrophilic (water lover) while non-polar molecules are called hydrophobic (water hating). This still leaves an electron in place. H C C H Fig. However, the rings three and four members are reactive due to the tension of the ring and behave like alkenes. (a) 2-aminopropane; (b) 1-amino-3-methylbutane; (c) 2-amino-3,3-dimethylbutane; (d) 3-amino. If the priority groups at each end of the alkene are on the same part of the double bond, the alkene is the Z isomer. In other words, they have the same atoms and the same bonds. Recognition of functional groups (C1) Interactions of dipole-dipole Definition Ionic bonding van der Waals 39. Amines and starches can be defined as primary, secondary, tertiary or qua- ternary admiditions depending on the number of carbon nitrogen bonds (Fig. A methylene group (CH3) is a primary carbon center, a group of methylene (CH2) is a secondary carbon center, a methamphetamine group (CH) is a tertiary carbon center, and a carbon center with four alkyl substituents (C) is a quaternary carbon center (Fig. Related Topics Nomenclature (B3) The most famous aromatic structure is benzene. This can take the form of ion bonding, hydrogen bonding, inter-dipole-dipole actions and van der Waals interactions. amrof atseuq ni enehcla'l â skcolCÉ ¬â ¢Â ehc emagel nu eresse eved ic ,otnatreP .giF)¬â ¯Ã ¯Ã(dnoB IP N C n C zp2 zp2 zp2 YP2 H N C .aznelav id inorttele ettes ah orolc II .)¡Â°Ã4(oiranretauq o)¡Â°Ã3(oiraizret ,))¡Â°Ã2(oinadnoces ,)¡Â°Ã1(oiramirp emoc itudeced eresse onossop ,)idimma e enimma ,icilihcla irunegola ,ilocla(ilanoiznuf ippurg inucla emoc ¬Ãsoc ,oinobrac id irtnec I evaihc etoN .idom eud ni itiurtsoc eresse onossop e)3HC e H(emagel oippod led Ātimertse el ebmartne da itneutitsos isrevid ah enetub-2 li ,etrap artla'D ?aiccir aiccerf anu acifingis asoC .giF(etsoppo inoizerid ni onitnup olopid id itnemom i ehc elat odom ni orol art israeinlla onossop olopid id itnemom itnenetnoc elocelom eL .ovittaer onem olodnedner ,elareneg ametsis led Ātilibats al atnemua otseuq e ocilinobrac oppurg li noc enoizaguinoc ni ¯Ã ocitamora ollena'L .imagel orttauq ilibissop onoS .)2 .iI .alocelom alled onretni'lla enoizisop ous li e etneserp elanoiznuf oppurg id opit li erinifed rep artxe eloger eirassecen onos am ,elanoiznuf oppurg nu itnenetnoc elocelom el rep erev onos)3B otnemogra(inacla ilg rep arutalcnemon id eloger elled etloM ilareneg elogeR ilanoiznuf ippurG - C enoizeS 63 .ilirtin e inihcla - eglovs is emagel elat iuc ni inumoc ilanoiznuf ippurg eud onotsisE .enehcla'lled Ātimertse ingo da imota eud i eratnorfnoc ¯Ã avisseccus esaf aL .ortin)d(;edimma)c(;animma)b(;elirtin)a(.onatneplitemid-3,2-linef-1)b(;eneznebline)a(.eranalp e adigir ais alocelom al ©Âhcrep otageips omaibba non am ,ilanogirt iranalp inobrac i ageips 2 PS enoizadirbi'l emoc otsiv omaibbA .ilatibro ilged Ātem a ilatibro ah oinobrac ingo ©Âhciop emagel eroiretlu nu elibissop Ã .¬â ¯Ã emagel nu e Æ¯Ã emagel nu ad otiutitsoc ¯Ã emagel oippod ingo ertnem Æ¯Ã onos inoizagilbbo elognis el ettut ,a9 .eranibba ehc itavele ¹Âip aigrene id ilatibro ilgen eresse inorttele ilg rep elicaf ¹Âip ¨Ã idniuq e aloccip ¨Ã ilatibro ilg art aigrene id aznereffid aL (In this example it is CH3. Carbon centers one of the simple ways to determine if a one The center is 1 worldwide åinder, 2nd åc, 3nd å¡ or 4 worlds å must count the number of bonds that lead from that carbon center to another carbon atom (fig. This leads to an orbital molecular that involves all the 2py orbitals in which the upper and lower lobes are combined to give two lobes similar to a pasta above and under the plan of the ring (Fig. 5a). Functional groups containing ties are tended to be reactive as the bond is more weaker of a bond ãhorto ’’ it is more easily broken. Some important eco-old piers that occur natural contain both groups-amino acids. C c h h h h h hhh hh hh hH 20 . 4-Ethil-3-Metilocane. In this case, the group with alphabetical priority should receive the lowest number. At any time, there is a slight excess of electrons in a part of the molecule and a light deãorth in a 'Other part. Alcheni who have two different substituents to each extremity of the double bond can exist as two ISO accounts Meri. Alcane molecules can interact in this way and the strength of interaction increases with the size of the alkanal molecule. However, the difference between the dimensions of the main and minor lobes is greater for the hybridized orbital Sp 2. Cho c h3 o e) f) Cl cl CL CL 1 2 3 4 5 6 1 2 3 4 6 5 correct ENRERCA FIG. 13). Ã ¢ â € “identifies the most long chain of carbon atoms. (a) etanothiolo; (b) dimetylsulãorth; (c) 1- (Metiltio) Propano. 24. QD256.5.P37 2003 547-production of production DC22: Andrew Watts this edition published on Taylor & Francis E-Libry, 2005. Paper) 1. The ketones and aldehydes are able to interact through the interactions Dipolo. The ionic bond is possible between a molecule containing an ammonium ion and a molecule containing a carboxylate ion. The links there is strong bonds in which each hydrogen atom uses its orbital meter to bind yourself to an orbital meat. Oxygen and carbon atoms are both otiutitsos-irt otiutitsos-irt ocitamora id enoizaremun id imetsis ilibissoP .2 PS (a) Ethane; (b) ethanoic acid. Key Notes Every bond in an organic structure is a ÃÂ bond or a ÃÂ bond. The major lobes of the three sp 2 hybridized orbitals point to the corners of a triangle, with the 2p orbital perpendicular to the plane. It does this by concentrating purely on the basics of the subject without going into exhaustive detail or repetitive examples. However, when a carbon atom forms bonds and is part of a molecular struc- ture, it can ¢ÃÂÂmix¢ÃÂÂ the s and p orbitals of its second shell (the valence shell). Therefore, the full name is methyl ethanoate. The lobes of the 2py orbital occupy the space above and below the plane of the x and z axes (Fig. Priority groups are determined by the atomic numbers of the atoms directly attached to the alkene. These dif¯Ã¬ÂÂculties are often compounded by the fact that current textbooks in organic chemistry are typically over 1200 pages long and can be quite expen- sive to buy. Some students ¢ÃÂÂswitch on¢ÃÂÂ to it imme- diately, while others can make neither head nor tail of it, no matter how hard they try. It is followed by section D on stereochemistry, then sections E and F, in which the basic theory of reactions and mechanisms is covered. Other amines are named by considering the amino group as a sub- stituent of the main chain in the same way as alkyl halides and ethers. It also explains the reactivity of carbonyl groups since the ÃÂ bond is weaker than the ÃÂ bond and is more likely to be involved in reactions. Dipole¢ÃÂÂdipole Dipole¢ÃÂÂdipole interactions are possible between polarized bonds other than N¢ÃÂÂH interactions or O¢ÃÂÂH bonds. Atoms linked by single bonds are sp 3 hybridized, atoms linked by double bonds are sp 2 hybridized* and atoms linked by triple bonds are sp hybridized.* sp 3 Hybridized centers are tetrahedral, sp 2 hybridized centers are trigonal planar and sp centers are linear. For example, two different substituents might be placed at equal from either end of the chain. The cis and trans isomers of an alkene are con¯Ã¬ÂÂgurational isomers (also called geometric isomers) because they have different shapes and cannot interconvert since the double bond of an alkene cannot rotate. (a) Alkene; (b) atomic numbers; (c) priority groups. (a) Aryl halide (X ÃÂF, Cl, Br, I); (b) alkyl halide or halogenoalkane (X=F, Cl, Br, I); (c) carboxylic acid chloride. Most cycloalkanes are unreactive to chemical reagents. (The number of hybrid orbitals must equal the number of original atomic orbitals used for mixing.) The hybrid orbitals will each have the same energy but will be different in energy from the original atomic orbitals. Since all the carbons are sp 2 hybridized, there is a 2py orbital left over on each carbon which can overlap with a 2py orbital on either side of it (Fig. In the latter system, the ÃÂ electrons are completely delocalized round the ring and all the bonds are equal in length. Related topics Properties of alkenes and alkynes (H2) Chemistry of nitriles (O4) Electronic con¯Ã¬ÂÂguration Alkynes De¯Ã¬ÂÂnition Geometry Nitrile groups 2px 2pz Original atomic orbitals sp hybridized orbitals sp 2py 2pz Energy 2s 2py Fig. 14). This results in a dipole moment which can be represented by the arrow shown in Fig. 5) illustrate different types of alcohols and alkyl halides. Note that there is no need to number the cycloalkane ring when only one substituent is present. sp Hybridization of nitrogen. Common The following are some of the more common functional groups in organic functional groups chemistry. Understanding organic chemistry leads to a better understanding of life chemistry and how the body works at the molecular level. If an alkane chain is linked to a benzene molecule, then the alkane chain is usually considered to be an alkyl substituent of the benzene ring. 25. H3C NH2 H3C CH2 NH2 a) b) Fig. The C¢ÃÂÂC and C¢ÃÂÂH bonds are strong ÃÂ bonds, and so alkanes C3H .otoza'llus lihcla ippurg Ārva edimma'l ,enima'nu noc otagelloc ¨Ã ocilissobrac odica'l eS .abmag anu e oiccarb nu atsoc non ehc e etneduts elovehcima ¨Ã ehc enigap 013 id elibitseg otset nu ni acinagro acimihc alled elaiznesse'l erasnednoc id atnet orbil otseuQ .onaporpolciclitemid-2,1-snart)b(;onaporpolciclitemiD-2,1-sic)a(.giF 4 5 2 1 3 3HC C3H 3HC C3H .ehcificeps inoizautis rep etattegorp eloger ertla onos iC 73 ilanoiznuf ippurg ied arutalcnemoN â 5C .giF(locla'l eranoizosp ebbervod enoizaremun al ,otnatreP .elanoiznuf oppurg leuq id ehcitsirettarac onos e ilanoiznuf ippurg a onoglovs is ehcinagro inoizaer elled etrap roiggam aL inoizaeR .)b4 .)a03 .)a2 .¹Âig o us onatnup ehc eccerf el odnangesid 3 2ps 2ps 2ps 2ps3ps 3ps 3ps 3ps 3ps 3ps 3ps 3ps 3ps 3ps 3ps 3ps 3ps 3ps 2ps H O C 3HC C C C3H 3HC 2HC C C3H 3HC 2HC C3H oiggallocni e arutturtS â A enoizeS 81 .oinobrac id irtelehcs isrevid onnah ,elorap ertla nI .orolc o onegisso ,otoza onoglovnioc ehc amgis imagel i ittut onognetnoc irete ilg e ilihcla ilg ,enimma el ,ilocla ilG .giF(H-C imagel i eredrep elicaf ¹Âip otlom ¯Ã de ,esselpmoc ¹Âip elocelom noc otttuttarpos ,osoion atnevid otseuq ,aivattuT .ortla'lled ednarg ¹Âip otlom obol nu noc otamrofed oirbunam nu emoc otamogas ¯Ã elatibro 3 ps ingO .giF enatneP enatuB enaporP enahtE enahteM enaceD enanoN enatcO enatpE enaxeH 4HC3HC C3H 32 arutalcnemoN â 3B .ehcimihc e ehcisif Āteirporp esrevid onnah ilanoizutitsoc iremosi ilG .eloger essets el onacilppa is am ,anetac alius esrevid inoizisop ni eresse onossop icitnedi itneutitsos I .giF(itla ¹Âip iremun noc itneutitsos ien ebberrudart is enoizaremun artla isaislauq ,otartsom oipmese'lleN .Ï emagel nu id enoizamroF .)b01 .eralocelom arutturts assets al e

eralocelom alumrof assets al onnah ehc iremosi onos ivitarugifnoc iremosi ilG SENAKLAOLCYC E SENEKLA â IVITARUGIFNOC REMOSI 2D acimihcoeretS â D enoizeS .icimihc itnegaer ied etrap roiggam alla ivittaer non 3HC 3HC C3H 3HC2HC itsopsid onos imota inucla ,aivattuT .giF(anacla anetac alled ocilinef etneutitsos nu ataredisnoc ¨Ã enezneb id alocelom al ,inobrac ies id ¹Ãip eneitnoc anacla anetac al es ,aivattuT .giF ni arutturts al ,otnatreP .52 .ilanigiro p2 e s2 ilatibro ilgen inorttele orttauq id elatot nu onare ortla'llad onu'l e YP2 elatibro'llad inatnol ¹Ãip li onais ehc odom ni etnenamir oizaps lo idniuq onnarepucco)itartsom ilapicnirp ibol olos(2 PS ilatibro ert I .giF(onegordi e oinobrac olos onognetnoc ehc ilanoizınuf ippurg I â¢Ã .enoizaguinoc alled asuac a Âtilibats eroiggam anu onnah itseuq ehcnA .giF 421 ORTNE 1 3 3 tcerroC 4 2 3HC 3HC 3HC H O 3HC H O ?¯Ã Âtem a 3 PS ilatibro ert Ârva ,enoizadirbi'l opoD .giF)B)A 3HCO O C H C3H H CC 3HC O C H C3H H CC .erete)b(;olonacla o locla)a(.icinortteleoerets itteffe ad atazneulfni ¨Ã elanoizınuf oppurg led Âtivittaer al ,aivattuT .etaremun eresse onoved non e elapicnirp anetac alled 1 enoizisop ni erpmes eresse onoved idiedla eL .1 enoizisop allen ais acitebafla Âtiroirp noc etneutits-bus li ehc elat odom ni itaremun onos itneutitsos isrevid noc inaclaolcic I .edimanatelite-N otamaihc ¨Ã 02 .)b1 .elapicnirp anetac allad onacifimar is ehc icilihcla itneutitsos onnah itacifimar inacla ilG .Ãtem a p2 elatibro nu ehcna ¨Ã'C .)auqca(ehcibofordi etinifed onos elocelom ilat e auqca ni etnemlicaf onovlossid is non ehc "issarg" id elocelom onos eralocelomretni emagel id amrof atseuq ni etlovnioc elocelom id ipit I .ocionate odica'lled avired ©Ãhciop ocilihcla otaonate nu ebberas eretse'L .oremosi emoc otudeced ¨Ã enehcla'l ,itsoppo ital ius onavort is eS .giF)b Âtiroirp 1 1 Âtiroirp 6 8 3HC2HC 3HC H O3HC C C C H C C H C O C C C .Æ¯Ã emagel led enoizatneserppaR)b(;enyhtE rep gnigeL Æ¯Ã)a(.ortla'lla ottepsir oizaps ollen »Â«Â «Â«Â «Â«Â «Â«Â «Â«Â «Â«Â-onos itneutitsos i ,otnatreP .giF)A ENEIDATUB-3,1 YP2 YP2 YP2 YP2 HH H H H H H H H H H H H H H H H H C CH H H C C H H H C C .giF 01 5 2 1 3HC 3HC anu onamrof ehc 2 ps otipmeir Âtem a itadirbi ilatibro ert ni ecudart is enoizazzidirbI 2 ps senelkA oiggallocni e arutturtS â A enoizeS 10 .elatibro s1 li arolla ednarg ¹Ãip otlom s2 elatibro'l noc acirefs amrof id onos icirefs ilatibro ilG .4 .L manahG ,kcirtaP ataD noitacilbuP-ni-gnigolataC ossergnoC led acetoilbiB ku.oc.secivresgnihsilbupnosmoht@fdnat.redroselas :liam-E ;424233 4621)0(44+ :.leT KU ,EB5 01PS erihspmaH ,revodnA yaW htroN esuoH notirehC secivreS gnihsilbuP nosmohT ad odnom led otser len otiubirtsiD ac.ratsi@fnar_tat :liam-E ;7322 622 778 1+ :leT eerF lloT ,adanaC ,2G4 R1M oiratnO ,hguorobracS evirD kralroR 47 sicnarF & rolyaT ad adanaC ni otiubirtsiD moc.gninraelnosmoht@sicnarfdnarolyat :liam-E ;4607 436 008 1+ :.leT ASU ,15014 YK ,ecnednepednI evirD nebbeT 05601 sicnarF & rolyaT retneC tnemlifluF ad itinU itatS ilgen detubirtsiD sicnarF & rolyaT oppurg led orbmem ¨Ã srehsilbuP cifitneicS SOIB/ecneicS dnalraG ku.oc.soib.www :egap emoh beW oipma odnoM ASU ,9922â10001 YN ,kroY weN ,teertS ht53 tseW 92 e KU ,NR4 41XO noxO ,nodgnibA ,kraP notliM ,erauqS kraP 4 srehsilbuP cifitneicS SOIB/ecneicS dnalraG 5 462 69958 1 NBSI .onegordi ad elatibro otipmeir-imes s1 nu e oinobrac ad elatibro 3 ps otipmeir ozzem nu atropmoc onegordi id omota nu e 3 ps otadirbi oinobrac nu art otamrof Ï emagel nU .ehcilcic enacla erutturts onos senaklaolcyC 2©Ïn2HnC elareneg alumrof al onnaH .iranretauq e iraizret ,iradnoces ,iramirp oinobrac id irtnec .giF enoizisop atem enoizisop otro enoizisop atem enoizisop rep ohtro X enoizisoP enezneborolhciD-3,1 .eribus onossop icinagro itsopmoc i ehc inoizaer id etnerappa otniribal li eracifissalc id odarg ni onos itneduts ilg es elaicurc otnattertla ¨Ã ilanoizınuf ippurg ius enoizes azret aL .giF)c)b)alC rB rB 2HN HO 3HC 93 ilanoizınuf ippurg ied arutalcnemoN â 5C .etnelavoc emagel nu erepmor aznes ititrevnocretni eresse onossop non iremosi ilg e ,ortla'lla onu'l ottepsir oizaps ollen .elanogirt .elanogirt eranalp Nwohs elpmaxe eht ni .rehto Hcae tcepser htw stneutitsbus owt eht fos noitisop eht rapmoc nac eno erehw 2 2 5 elpmis ypnewoh. 1 6 5 4 2 1 1 6 4 3 3 2 2 1 8 = 4 + 4 + 4+1 = Latot tneutitsbus 8 = 5 + 5 + = Latot tneuttitsbus gnorw 2on 2on lc 7 = 2+2 Tneutitsbus tcerroc 2on 2on 2on lc .tneutitsbus lylas na ket detaert the snow eht dna Eht dna Eht dnaklakla remaned si dica .burnn lanoitcnuf eht tnob eht sedilah hhh eht ,revewoH .giF H H H H H H H H H H H C C C C C .eman eht fo strap htob neewteb ecaps a eb tsum erehT .enatneplyhtemiD-2,2 .7 giF)c)b)a)dH2OC 2HN HO 3HC spuorg lanoitcnuF ÂÃÂ¢ C noitceS 83 eht fi 1 noitisop because decalp Eb ot sah tneutititbus tnaveler eht ,niaga ecno ?tneserper msinahem tahw seod esenaht .Latibro ytpme slatibro dellâ â¬ï-Fla h owt era ereht taht hcus slatibro otni Og etaht .gif)b)c)a)f)f)e o c 2rn r h o o c o r o c r - H+ H+ dica cilyxobraC noi muinommA enimA O O RC HO O RC H H H RN H H RN sniag negyxo eht taht hcus negyxo evitagenortcele erom eht sdrawot deziralop era dnob lynobrac eht ni snortcele ehT .sdnob emas eht dna alumrof ralucelom emas eht evah sremosi lanoitarugÂÃ¬ ã¯noc seton yon yek .llehs Nortcele Tsrâ â¬ã´ eht ni slatibro p on ereht ecnisususus yb dnob ylno nac yeht .35)f)d c3h o 3HC op 3H O1 .Egdew di yb detneser er eht tuo gnimoc sdnob dna ,Eggdew dehctah that yb detneserer era eht dnigeg sdnob EB OSLA NAC SMOTA ENIROLHC DNA NEGYXO ,NEGORTIN ,NEGYXO ,NEGORTIN 7 NOITAZIDIRBYH â€â€œâ€â€ Â,¬ -Bonding in HCN. 1. (V) Other substituents are nominated and ordered in the same way as the Alkans. Alcheni and alcheni and alchini have respectively the sufãorth and -yne (Fig. Consequently, the competing isomers are composed with different properties. Cyclcans branched with more branches the alkally replacement with alphabetical priority is in position 1. Note that a quaternary amine is positively loaded and is therefore called a quaternary ammonium ion. The symbol n is used to show that the replachers are on nitrogen and not another part of the Scheleton Alcanamide. The ketoons (o Alka-Nones) are identified by the sufã 22-anon. 4-Metyl-2-salanol. Department of chemistry and chemical engineering of Patrick, Paisley University, Paisley, Scotland 4. Sigma (ãhorto ') the ties They are strong links with a circular section formed by the front overlap of two atomic orbitals. 42. Multi-ramified if there is more than an alkilic replacement present in the structure, the substituents of the alkans are the name D in alphabetical order, numbering again from At the end of the chain, more close to the substituents. Functional groups have deceased as aromatic if they have an aromatic ring directly attached to them. (a) alchene; (b) Alkyne; (c) aromatic. The remaining 2py orbital is not influenced. SP 3 hybridization. Two of the hybridized SP 2 orbitals are gathered with solitary electron pairs, which leave two orbeds in half cliff available for the link. After the hybridization, they have two orbitals SP 3 in Metã and formed two ties. This is known as hybridization sp. Examples - All the bonds shown are bonds except those labeled as ã ¢ Â². 2); Key notes The functional groups are portions of a molecule that contain different atoms from carbon and hydrogen, or that contain bonds other than Canda Canda "C and CVa ¢ â,¬" H. Title. All atoms in an organic structure (except otni tâ¬ã¯ tfel snortcele owt ereht .ygrene lauqe fo slatibro 2 ps dezidirbyby eerht m m slatibbro p2 eht fo owt htiw â€Ti sdew SETON YEK NOIitirbyhyh 2 Ps 4a Gnidnob DNA ERUTCORTS â€â€ã NOITCES ã (Dnob ip c yp2 zp2 zp2 yp2 yp2 yp2 hp2 h c c a c c ced dna erurts â€â€â€TMeth 61 .snort in denâ sevig noitazilacoled laitrap sihT .tneutitsbus lykla na eb ot deredisnoc si yteiom enakla eht dna metsys tnerap eht si enaklaolcyc eht taht hcus deman yllausu senaxeholcyc era yteiom enakla na ot deknil yteiom enaklaolcyc a fo gnitsisnoc senaklaolcyC dehcnarB 52 erutalcnemoN ÂÃÂ¢ 3B . 15)C)C)C)C)b3HC2HC s C3H 3HC s C3H .gif Noitamrof Retse 18 .05 .c .câ€â€âc Dna Hâ€â€â€âc NAHT rehto sdnob dna A SNIATNOC HCIHW)noitrop dexob(elucelom eht fos noitrop a SAH ,)B1 .Noitcaer Fo Eht nwod nwod dna tnegaer a FO hcaorppa eht rednih 2 Ps ,Ps Rehtie Era)Negodyh tpecxe(ertucrts ciagro na smota eht ll lla sretecidirbybyh .ennotek citora)d(;dihna cilyxaCara cilymora)c(;slatied citahtah)(;Etoteka)a(;Etoteka)aaaakea)a (;ynoteka)a (;ynotik cita)a (;ynotik cita)a (;ynotik cita)a (;ynotik cita)a (;ynotik cita)a (; htiw dexim si latibro s2 eht ÂÂÃ¢ ;noitazidirbyh 3 pssanwonksisihT.slatibrop2eerhtllahtiwdeximsilatibros2eht ÂÂÃ¢ .giF(nordehartet a fo srenroc eht ot gnitniop yb debissop as rehto hcae morf trapa raf sa ecaps a ypucco lliw latibro 3 ps hcae .GFf of Margaid Level ygrene eht .sdnob â€â€ã Era Sdnob Gniniamer eht ,smota owt yna neewteb dnob ero naht ero Detagujnoc in Hcus Smetsys Detagujnoc .Dezidirbybyh 3 Ps ro 2 Ps ,s Rehtie Era Era remaining 2P orbitals. This remains empty. The Mo Anti -which is of the highest energy and is made up of two deformed spheres. 10 Illustrate how different parents names can be used. 49. The intermolecular hydrogen bond is possible for alcohols, carboxylic acids, Amidi, Amine and Phenols. 6 shows how nitrogen Valenza electrons are arranged after the hybridization SP. If the functional group is at the center of the main chain, the numbering is chosen to ensure that other substituents have the lowest possible number (for example 2,2-Dimetyl-3-sara and not 4.4-Dimetyl-3-Penanone ; Fig. Examples of hybridized centers SP, SP 2 and SP 3. The most close shell has a single or orbital - the orbital 1S. N ch3 ch2ch3h3c n h3c ch2 ch3 ch3 ethane fig. Alkies branched branched branched branched the alkanes are Alcani with alchyl substituents who branch off from the main chain. Ionian ties are possible between functional groups ionized such as car-boxylic acids. Location. 2-Metyl-3-men. 22. 1) and therefore four links are possible. Organic chemistry is an exciting argument for an essential understanding of molecules and their own understanding. H3C H3C BR BR H3C CH3 BR H3C CH3 CH3 1O 2O 3O A) B) C) Fig. Key notes The presence of functional groups affects the proprietary points, boiling points, polarity, moments of dipole and solubility. There are three possible types of hybridization - hybridization SP 3, SP 2 and sp. A maximum of two elements of opposite spin (principle of exclusion of Pauli) is allowed to each orbital. 9). 2) It is a 1-big. Hybridized orbitals and the Orito Occupy 2py spaces the most distant possible. A bond is the weaker of a bond is ãhorto 'since the 2py orbitals overlap laterally, with consequent more weaker overlap. Section H ã ¢ âvelop â € œAlkenes and Alynes 99 H1 Preparation arutturtS italerroc itnemogrA .ilanoizınuf ippurg isrevid ied inoizaer alle acigol anu atroP .7 IV otunetnoC 162 ehcillatemonagro inoizaeR 7L 852 icilihca ihcla id inoizaeR 6L 652 enoizutitsos alla ottepsir enoizanimilE 5L 252 enoizanimilE 4L 742 1NS a ottepsir 2NS inoizaer el onazneulfni ehc irottaF 3L 242 alifoelcun enoizutitsoS 2L 932 ocilihcla id ocilihcla id ehcisif e enoizaraperp 1l 932 icilihcla ihclaâ ¬â l enoizes 432 etalone inoizaer 7k 422 inoizaer 6k 912 ocilissobrac odica'lledââ itavired id inoizaraperp 5k 712 icilissobrac idica id inoizaraperp 4k 312 Âtivittaer 3k 902 alifoelcun enoizutitsos 2k 502 Âteirporp e arutturts 1k 502ââ itavired ocilixorac odica e ocilixorac odicA â¬â ¢Ã K enoizes 202 inotek e ediedla otarutas non-²Ã®Ã ,±Ã ®Ã 11J 002 enoizadisso e enoizudiR 01J 891 enoizanegogolah-±Ã ®Ã 9J 191 italone inoi id inoizaeR 8J 781 ofloz e onegisso id ilifoelcuNâ ¬â ¢Ã alifoelcun atnuiggA 7J 4 81 otoza id ilifoelcuN - alifoelcun atnuiggA 6J 181 itteffE aciraC â¬â ¢Ã alifoelcun atnuiggA 4J 371 alifoelcun atnuiggA 3J 961 ÂteirporP 2J 761 enoizaraperP 1J 761 ENOTEHC E EDIEDLAâ ¬â ¢Ã J enoizeS 461 enoizudir e enoizadissO 7i 061 itiutitsos-irt e-id inezneb id isetniS 6i 051 illenA otamrofonom otiutitsos-onom enezneb id ehcilifonom iliforttele inoizutitsos id iliforttele inoizutitsoS 3I 731 Âteirporp e enoizaraperP 2I 531 ÂticitamorA 1I 531 acitamora acimihC-I enoizeS 131 itaguinoc seneiD 11H 921 ilanimret inihcla id enoizalihcla 01H 721 senykla .ACIFINEKLA ACIFINEKLA 421 ENOIZICINEKLA 421 ENOIZINIKLA 9H ENOIZICINEKLA 421 ENOIZAZZICOKLA 9H ENOIZICINEKLA 421 ENOIZICINEKLA 421 ENOIZAZZICOKLA 421 ENOIZAZZICOKLA ENOIZILIHCAKLE 421 senefortcelE 9H 421 inekla id inekla id enoizudiR 6H id enoizudiR 511 enoizazzilacobrac led enoizazzilibatS 5H 211 icirtemmis non inehcla a aliforttele atnuiggA 4H aliforttele atnuiggA 4H 501 icirtemmis inehcla a aliforttele atnuiggA 3H 101 inihcla e inehcla id ÂteirporP 2H 99 inihcla e inehclA of the IBRIDATION SP 3 of carbon (A1) SP 3 (A3) SP 2 2 odica'l ,iretse ilg noc emoC .giF 5. o 9901 anigap allad onaip len acirdeartegatep amrof id emagel lad ecse ehc anigap id emagel li orteid av ehc emagel h c c h h H .giF(onate'l ,oipmese dA .)12 .giF 2HC .2 PS itadirbi onos onegisso'l ehc oinobrac id imota ilg ais iuc ni)o¯ÃC(ocilinobrac oppurg nu id onretni'lla emagel li ageips airoet assets aL icilinobrac ippurg 11 2 PS enoizadirbIâ ¬â ¢Ã 4A .olonatub nu ¨Ã 1 .giF aigrene'L zp2 itadirbi ilatibrO PS ilanigiro icimota ilatibrO zp2 XP2 xp2 S2 PS YP2 .orurolc lionatneplitemid-3,2)b(;ocionatublitem-2 odica)a(.idimma e enimma ,irunegola ,ilocla emoc ilanoizınuf ippurg eraived o oinobrac id ortnec nu eraived rep :inoizautis id Âteirav anu ni atazzilitu eneiv)¡Â°Ã4(oiranretauq e)¡Â°Ã3(oiraizret ,)¡Â°Ã2(airadnoces ,)¡Â°Ã1(airamirp arutalcnemon aL emon ¯ÃEED airanretauq e airaizret ,airadnoces ,airamirP 6C 6C ilanoizınuf ippurGâ ¬â ¢Ã C enoizeS .onateonimalitemid-n ,N .elanoizınuf oppurg li eredulcni eved)erotineg anetac o(elapicnirp anetac aL evaihc etoN ilanoizınuf ippurg ied arutalcnemoN 5C ilanoizınuf ippurg Iâ ¬â ¢Ã C enoizeS .eneznoborolcid-M a otaiverbba eresse ²Ãup otseuQ .C" C imagel i olos onartsom icirtelehcs ingesid I .¬â ¯Ã imagel eud eramrof rep itazzilitu eresse onossop ehc p2 ad ilatibro id onnah otoza'l ehc oinobrac li aiS .61 3 PS otadirbi oinobrac nu id acirdeartet amroF .acitafila edimA)d(;acitamora edimma)c(;ocitafila eretse)b(;ocitamora eretse)a(.S1 elatibro'llad isrevid icimota ilatibro id enoizaretni'lled itamrof Æ¯Ã imagel id ipmese irtla omerdev ,erutuf inoissucsid elleN .orol art ereilgecs omaissop non e)oinobrac(issets ilg onos imota ilg ibmartne ,ortsed otal luS .)b9 .Æ¯Ã emagel nu a onrotta emagel led olleviG .giF H H H H H HH aigrenE)otouv(eralocelom elatibrO gnidnobitnA)oneip(eralocelom elatibrO gnigeL = ocimotA elatibrO S1 ocimota elatibrO ocimota elatibrO S1 + enoizadirbI amgiS etnelavoc amgeL)5A(enoizadirbI PS)4A(parent is identified. For example, the Structure in Fig. 31. 2B). 5a is more correct than the ni itangesid eresse onossop inacla ilG evaihc etoN .26 .enetub-2-snart)c ;enetub-2-sic)b ;enetuB-1)a .Ð021 ¨Ã ibol itseuq id onucsaic art ologna'L .ilibissop onos ollena'lled inoisnemid el ettuT .ilibissop onos non irunegola lihcla o oirerret-auq locla ,¬ÃsoC .ilanoizutitsoc iremosi isrevid emoc eretsise ²Ãup eralocelom alumrof eralocitrap anu id senaklA senaklA .giF(onegisso onognetnoc ehc e imagel ippod onoglovnioc ehc ilanoizınuf ippurg â ;)4 .emagel olognis nu olos eramrof ²Ãup e elatibro 3 ps otipmeir ozzem olos nu ah orolc lI .etnemavittepsir ururolc lina- e odica id irurolc e ocionaa odica- ossiffus li odnegnuigga itacifitnedi onos odica id iruolc i e icilissobrac idica ilG icilissobrac idicA .onegisso o otoza ad isrevid itnemele noc elb-issop ehcna ¨Ã onegordi emagel lI .itadirbi ps ibmartne onos)NµÎC(elirtin oppurg nu id oinobrac e otoza id imota ilG .oinobrac rep acinorttele enoizarugifnoC .giF)b)a3HC 3HC2HC2HC 3HC C3H 3HC2HC2HC 3HC .61 .enaxeholcyclitem-3-lyhte-1)c(;enaxeholcic-1)b(;enaxeholcyclyhteM)a(.34 .41 .oinobrac id omota ingo ad 3 ps oneip ozzem a idirbi ilatibro id enoizisopparvos id atropmoc 3 ps itadirbi oinobrac id imota eud art otamrof Ï emagel nU .giF(Ð401 .emon led oizini'lla onognev e ilihcla itneutitsos emoc itaredisnoc onos itseuQ .45 .ocitafila enotehc nu ad osrevid ozzerp nu da ecsigaer ocitamora enotehc nu ,oipmese dA .inotehc art eralopretni olopid-olopid enoizaretni)b(;enotehc nu id olopid id otnemoM)a(.Ï imagel eud eramrof rep 'no-edis' erropparvos onossop p2 ilatibro itnenamir I .71)b = atalogna alocelom o401 3HC O H C3H O .iov ad onatnol anigap allen odnatnup ats ocilitem oppurg li ehc acidni otaliffa oenuc anu ertnem ,iov id osrev anigap al odnecsa ats ocilitem oppurg li ehc acidni oenuc odilos nU .alocelom alled laci-ocisif Ârenimreted eralop elanoizınuf oppurg id azneserp al ,isac ied etrap roiggam alleN ilanoizınuf ippurG â C enoizeS 43 .giF ni faster and more efficient if C-H C-H are omitted. (a) Geometry of sp 3 hybridized nitrogen; (b) geometry of sp 3 hybridized oxygen. H3C CH3 H H H3C H H CH3 a) b) Fig. These functional groups are de¯Ã¬ÂÂned as aromatic or aliphatic depending on whether the aryl group is directly attached to the carbonyl end of the functional group, that is, Ar¢ÃÂÂCO¢ÃÂÂX. 8). This is a strong interaction and so sigma bonds are strong bonds. In the case of esters and amides, the aromatic ring must be attached to the carbonyl side of the functional group. This in turn transforms a list of apparently unrelated facts into a sensible theme which makes remembering the reactions a ¢ÃÂÂpiece of cake¢ÃÂÂ (well, nearly). This deformed dumbbell looks more like a p orbital than an s orbital since more p orbitals were involved in the mixing process. The p orbitals on carbon and oxygen are used to form a ÃÂ bond. Ester formation. Key Notes Intermolecular bonding takes place between different molecules. Both these functional groups are ionized to form a structure known as a zwitterion (a neutral molecule bearing both a positive and a negative charge) and intermolecular ionic bonding can take place (Fig. 23), that is an ethane chain and so this molecule is an aminoethane (N,N-dimethylaminoethane). The numbering of the rest of the ring is then carried out such that the substituent positions add up to a minimum. Both these functional groups are always at the end of the main chain and do not need to be numbered. Aldehydes and The suf¯Ã¬ÂÂx for an aldehyde (or alkanal) is -anal, while the suf¯Ã¬ÂÂx for a ketone (or ketones alkanone) is -anone. Ethane. C C CH3O H CH3 CH2CH3 C C O H C C C C O H C C c)a) b) 6 6 Priority No difference 1 8 6 8 6 1 Fig. Simple amines are sometimes named by placing the suf¯Ã¬ÂÂx -ylamine after the main part of the name (Fig. R X R Cl C OX b)a) c) Fig. Each of the sp 2 hybridized orbitals has a deformed dumbbell shape similar to an sp 3 hybridized orbital. Cycloalkanes are orev ¨Ã oirartnoc li ,aivattuT .enoizadirbi 2 PS .olonatnep-3-litem-4 non e olonatnep-3-litem-2 ¨Ã)3 .)olonatem(eralocelomretni onegordi emagel)b(;)onatem(eralocelomretni slaaW red naV)a(.enoizaer id Âticolev al eracidni ehcna onossop icinorttele itteffe ilG .giF 4 3) a 1 2 2 2 1 4)B 3HC 3HC O HO lC O 14 ilanoizınuf ippurg ied arutalcnemoNâ ¬â ¢Ã 5C .44 enimA enimA idica irurolc e icilissobrac IDICA INOTEHC E IDIEDLA IHCULA ILOCLIA ENYLA E INECLA ELOGER ELARENEG ELARENEG RETSE IRUILAH LIHCLA E REHTE .oraihc oigirg ni otatneserppar ¨Ã zp2 ilatibro ilged enoizisopparvos allad etnavired ¬â ¯Ã emagel lI .olopid otnemom led avitagen Âtimertse'lla atnup aiccerf aL .giF x Y)A o021)B Z Z Y X .giF(.otadirbi elatibrO 3 PS .icimota ilatibro eud elatnorf enoizisopparvos allad itamrof onos e enoizes- eralocric ecorc anu onnah imagel i Æ¯Ã :)Æ¯Ã(amgis emagel nu id oipmese nu ¨Ã emagel id onegordi id eralocelom elatibro'l imagel amgiS .giF(elanoizınuf oppurg lI ilanoizınuf ippurg a otaccatta etnemattered ¨Ã ocitamora ollena nu iuc ni olleuq ¨Ã ocitamora elanoizınuf oppurg nU ocitamorA .agnul ¹Ãip anetac allus enoizisop aus al e etneutitsos li acifitnedI .etneutitsos li atnevid onaclaolcic oppurg li e erotineg ametsis li atnevid anetac anacla ,ollena'lla ottepsir oinobrac id imota ¹Ãip eneitnoc anacla enoizrop al eS .olonatub-1-lite-2 ¨Ã arutturts al rep otelpmoc non e ilgnup e 2 enoizisop ni ocilite oppurg nu ah)2 .inobrac i art ¨Ã otartsom emagel li ©Ãhciop b5 .giF(arutturts aL . Âtlaer allena omaivresso ehc imagel orttauq i eramrof id oinobrac la etnesnoc e enoizadirbi emoc otnoc ¨Ã otseuQ .1 yP2 1 xp2 2 s2 2 s1 ¨Ã oinobrac id omota nu id acinorttele enoizarugnoc al ,otnatreP .p2 ilatibro ilged amirp otattart ¨Ã ehc , elatibro S2 elatibro'lled amirp gnilef¯Ã ¨Ã S1 elatibro'L .cce ,)21H6C(onaseolcic ,)01H5C(onatnelpolcic ,)8H4C(onatubolcic ,)6H3C(onaporpolcic ¨Ãoic ,ollena'l onognopmoc ehc oinobrac id imota id oremun li odnoceS The Alcana portion has more carbon atoms compared to the cycl against cyclealcan Case The cycloalcan is considered a substitute for the alkaline portion (i.e. N-cycloalkilalcano). However, carbon forms four bonds! How does a carbon atom form four ties with only two electrons scattered? Hybrid orbitals are organized as far away as possible from each other so that the main lobes indicate the coronants of a tetrahedron. H3C CH3 NH2 H3C NH2 H3C CH3 H3C CH3 CH3 NH2NH2 CH3 Fig. They have the general formula CNH2N. Section B - Alcani and Cyclaalcans B2 Drawing structures Câ € "H Bond There are several ways to draw organic molecules. 3b). In this example, the structure is called 5-etil-3,3- dimethylheptano (Fig. However, this is not always true. It is also possible a strong bond between the two carbon atoms of ethenes due to the overlap of SP 2 Orbitals hybridized by each carbon (Fig. On the left side, oxygen has a higher atomic number than hydrogen and has priority. Note that the substitute and the main chain are a complete word, i.e. 2- methylpentane instead of 2-methyl Pentane. They are appointed by the following procedure: Key Notes The names of the first 10 simple alkanes are methane, ethane, propane, butane, pentano, esano, eptano, octano, nonano and decano. 6 is called 5-etil-2,2,6-trimethyldean. 17. This is known as the Aufbau principle. Skeletal drawing of butane. Each SP hybridized carbon of an alchina can form two ï `` bonds using SP. 21 hybrid orbitals. This results in greater stability so that aromatic rings are less reactive than alchenes. The SP 3 hybridization explains the tetrah Carbon edurale in saturated hydrocarbon structures. X Preface 10. In addition, the key notes at the beginning of each topic sum up the essential facts covered and help focus the mind on the essential elements. Each atom of hydrogen has an atomic orbit in half 1S and when atoms approach etnatlusir etnatlusir id oremun li(SOM eud errudorp per onocsigaretni icimota ilatibro ilg ,ortla'l must equal the number of original atomic orbitals, Fig. Section C ¢ÃÂÂ Functional groups C4 PROPERTIES AND REACTIONS Properties The chemical and physical properties of an organic compound are determined by the sort of intermolecular bonding forces present, which in turn depends on the functional group present.Amolecule such as ethane has a low boiling point and is a gas at room temperature because its molecules are bound together by weak van der Waals forces (Fig. Intermolecular hydrogen bonding between alcohols. This is what is meant by the expression tetrahedral carbon. In this case, numbering is necessary to identify the position of the cycloalkane on the alkane chain. Key Notes In sp hybridization, the 2s orbital and one of the three 2p orbitals are ¢ÃÂÂmixed¢ÃÂÂ to form two hybridized sp orbitals of equal energy. sp2 2px 2py 2s 2pz Original atomic orbitals 2py sp2 hybridized orbitals Energy Fig. By Hund¢ÃÂÂs rule, Key Notes In sp 3 hybridization, the s and the p orbitals of the second shell are ¢ÃÂÂmixed¢ÃÂÂ to form four hybridized sp 3 orbitals of equal energy. The bonding MO is shaped like a rugby ball and results from Key Notes When two hydrogen atoms approach each other, their 1s atomic orbitals interact to form a bonding and an antibonding molecular orbital (MO). H3C C C C CH3 CH3 CH3 CH3 CH CHH3C CH3 CH C(CH3)H3C CH2CH3 1 a) b) c) 1 53 3 34 4 45 1 22 2 Fig. The deformed dumbbell shapes allow a much better orbital overlap than would be obtained from a pure s orbital or a pure p orbital. 5-Ethyl-2,2,6-trimethyldecane. 6. For example, the ester (Fig. Once this happy state of affairs has been reached, the relevance of organic chemistry to other subjects such as genetics and biochemistry suddenly leaps off the page. This means that a molecular orbital is formed round the whole ring such that the six ÃÂ electrons are delocalized around the ring. The ÃÂ bond is weaker than the ÃÂ bond, but is strong enough to prevent of the CÃÂC bond. Such bonds have a dipole moment and molecules can align themselves such that their dipole moments are parallel and in opposite directions. The Z/E nomenclature allows a clear, unambiguous de¯Ã¬ÂÂnition of the con¯Ã¬ÂÂgu- ration of alkenes. 5); ¢ÃÂÂ functional groups which contain a halogen atom (Fig. 8 CH3a) b) c)1 1 3 5 Fig. Benzene is not the only parent name which can be used for aromatic com- pounds (Fig. Benzyl group. The polarity of molecules depends on which functional groups are present. 41. 19). What are nucleophiles and electrophiles? For example, the structure in Fig. All the carbon atoms in an alkane are sp 3 hybridized and tetrahedral in shape. H O CH3 H3C H O CH3 H3C CH3 CH3 Wrong 12 3 4 3 2 4 5 1 5 Correct Fig. Related topics De¯Ã¬ÂÂnition (B1) Drawing structures (B2) Aliphatic and aromatic functional groups (C2) Common functional groups De¯Ã¬ÂÂnition H3C CH3 H3C C OH O Carboxylic acid functional groupb)a) Fig. 3a). Each bond junction is assumed to have a carbon atom with suf¯Ã¬ÂÂcient hydrogens present to make up four bonds. Section C ¢ÃÂÂ Functional groups C3 INTERMOLECULAR BONDING De¯Ã¬ÂÂnition Intermolecular bonding is the bonding interaction which takes place between different molecules. Energy level diagram for sp 2 hybridized oxygen. The one with the highest atomic number takes priority over the other (Fig. It is not possible to get quaternary alcohols or quaternary alkyl halides. Electronic For carbon, the ¯Ã¬ÂÂrst two electrons ¯Ã¬ÂÂt into each sp orbital according to Hund¢ÃÂÂs rule con¯Ã¬ÂÂguration such that each orbital has a single unpaired electron. ISBN 0-203-42761-0 Master e-book ISBN ISBN 0-203-44168-0 (Adobe eReader Format) (Print Edition) tandf.co.uk.¢ÃÂÂ 5. In Fig. ÃÂ-Bonding in ethyne. (Note that there is a space between both parts of the name.) Amides Amides are also derivatives of carboxylic acids. Simple amines can be named by placing the suf¯Ã¬ÂÂx -ylamine after the root name. a) b) erutalcnemon 3b snaklaolcyc dna â€“â€ã B Noitces .gnir Ranalp that Stluser hcihw Sdnob âıt smrof Nobrac Dezidirbybyh PS Owt Sah Nobrac Eht .dnob â€ã lynarac eht Fo Noitamrof)b(;dnob âơbracac eht Fo Noitamrof)a(sededima)b(senima)a(.01 â€t yp2yp2 H H H H H H O C)b yp2yp2 H H O C .seitreporp lacimehc dna lacisyhp tnereffid htiw sdnuopmoc tnereffid era esehT .snortcele deriapnu ruof era ereht taht snaem hcihw snortcele htiw dellÂÂ¬Ã¯ flah lla era yeht .)11 .giF)b)a H H gnidnob negodyh h h h h h h h h co gnidnob slaaw red nav h h h c3h h c3h ch snoitcaer ceitrepop)11j(Senotek dna sedydla detarasnu-â-gts(seneid(seneid(seneid-ht $¢¢¢o LANOITCNUF FO noitiscer Smota .degnarra era era smota eht yaw eht yaw eht of reffid tub ,alumrof ralucelom eht eht evah hcihw sdnuopmoc era sremosi seton yek .gif(edâ â â â â â â â s lyhtemic ,Elpmaxe rof ,stneutits -bus -busy eht htiw mht shit gnixâ â¬ïerp dna Edâ â¬â°T in the rehteoiht ysimh srehtneih s ni ,dettimsnart ro decudorper eb yam koob siht fo trap oN .edilah lykla ,rehte ,lohocla ÂÂÃ¢ snobrac lardehartet htiw spuorg lanoitcnuf ÂÂÃ¢ .enahtemlyxeholcyc ton dna enaxeholcyclyhtem si a9 .sremosi lanoitarofmnoc dna ,sremosi lanoitarugifnoc ,sremosi lanoitttestsnoc â€â€â Sremosi Fo sepy eerht eerht eerht eerht ereht .Latibro p2 gniamer eht dna slatibro noitarugâ â¬ïnnoc 2 dezidirbyrby tâtin tâ CINORTCELE .2 Noitide dnoces yrtsimehc ciagro .dnob hâ€â€âc dna câ€â€âc yreve Gniwohs nward eb noissimo enhte . Enekla eht Fo edis emas eht no era eht fo sdne tnereffid to stneutitsbus rehtehw if gnidneped snart snic sic then denâ¬ã¯ed Eb nacla elpmis Alkane the names of the simplest the straight chain alcoans are shown in Fig. The electrons in each orbital have opposite turns and this is represented in Fig. The main rules are as follows: (i) the main chain (or parent) must Include the functional group, and therefore it may not necessarily be the long chain (Fig. 5 is called 5-ethyl-2,2-Dimetildacan and not 2.2-Dimetyl-5- ethildican. A slight negative charge and the Carbon gains a slight positive positive charge however, the small three and four members are reactive and behave like Alcheni. C ch hh a) b) c c h fig. instead, these functional groups are considered replacements of the main alcane chain. Cié means that the nitrogen has three orbitals SP 3 by cliff and can form three pyramid -shaped bonds. 35. 36. Related topics (* with the exception of the hybridized hybridization centers SP 2 of hybridization SP 2 of training r2cãorthr2) SP 3 (A4) SP Hybridation (A5) hybridized ue ãhorto 'and è 22 Bonds Reactivity C h c h c c c c c C clo h oh3c ch3cch2 ch3 ch3 h3cch2 ch3 h3c ue â âvelop â,¬ âvelop âaly âvelop Structure and link 1 A1 atomic carbon structure 1 A2 against Covalento and Hybridizza SP Hybridization 14 A6 Bonds and Hybridized Centers 17 Section B ã ¢ â,¬ â € Alcani and Cyclealcani 19 B1 deãortem 19 B2 Drawing structures 20 B3 nomenclature 22 Section C ã ¢ âvelop œ Functional groups 27 C1 Recognition of functional groups 27 C2 Aliphatic and functional aromatic groups 29 C3 intermolecular bond 30 C4 properties and reactions 33 C5 nomenclature of compounds with functional groups 35 C6 C6 primary, secondary, Tertiary and quaternary nomenclature 43 Section d ue ¢ âvelop â € œStereochimica 45 d1 isomers Consritions 45 D2 C isomeri generic i ã ¢ â,¬ ÂUE Â establish â € œalcheni and cyclealcans 46 d3 conductive isomers - optical isomers 49 d4 conformational isomers 56 section and ã ¢ â,¬ â € œ nucleophilic e e inoizaer id enizzod id oiap nu erazziromem id odnacrec ,arutalcnemon alled eloger el noc ittap a erinev per odnattol sta ehc onna omirp id etneduts onu per etnemlaiceps ,eraf ad asoladnacs enoizamreffa'nu erarbmes ebbertop atseuQ !idecorp ehc onam nare elicaf ¹Ãip atnevid otnauq ni erailucep otnemogra nu ¨Ã acinagro acimihc aL .orunegola o locla'l otaccatta ¨Ã iuc a oinobrac led adnoces led adnoces e oiraizret o oiradnoces ,oiramirp emoc itideced onos icilihcla irunegola ilg e ilocla ilG .otnemagelloc id emagel la emagel oippod a erettarac id ollevil oloccip nu onnad idniuq e ,oniciv emagel nu id P ibol ia isropparvos id odarg ni onos emagel nu id P ibol i ,imetsis ilat nI .ilirtin e idica idirdina ,idica irurolc ,idimma ,iretse ,icilissobrac idica ,inotehc ,idiedla ,inihcla ,inehcla ,icitamora illena onos ¬â ¯Ã imagel onognetnoc ehc inumoc ilanoizınuf ippurG .itsopsid onos imota ilg iuc ni odom len onocsireffid am ,)imota issets ilg onnah ¨Ãoic(eralocelom alumrof assets al onnah ehc itsopmoc onos iremosi ilG enoizudortnI 1D acimihcoeretS alled ilanoizutitsoc iremosi ilGâ ¬â ¢Ã D enoizeS .)C2 .giF ADNOB LED ENOIZATOR H H H H C C H H H H C C C C .)osrevartta otacifingis ¢â negegtneË ¬â ¢Ã acsedet alorap allad(E emoc atangised ¨Ã enehcla acimihcoeretS aLâ ¬â ¢Ã D enoizeS 84 .)4¯Ã3 ©Ã ¯Ã1 orevvo(otterroc emon lad otunetto elatot la eroirepus ¨Ã ehc 6 ¯Ã 1 ©Ã ¯Ã5 ¨Ã itneutitsos inoizisop il emeisni odnegnuigga otunetto elatot lI ©Ãhciop otterroc ¨Ã non emongoc lI .odom osrevid nu ni itnui imota ilg onnah ehc eralocelom alumrof assets al onnah ehc itsopmoc onos enoizired id ilanoizutitsoc iremosi ilG .6 otunetnoC 59 setalonE 5G 49 siweL isab e idicA 4g 88 esab aznetsiseR 3g 28 2g 97 odica id isab e idicA yrwoL id isab e idicA â ¬â ¢Ãdetcaif£ÃrB 1G 97 esab id inoizaeRâ ¬â odicAâ ¬â ¢Ã G enoizeS 57 imsinaccem 2F 37 inoizaeR 1F 37 imsinaccem e inoizaeRâ ¬â ¢Ã F enoizeS 96 ehcinagro erutturtS 4E 66 ertuen ehcinagroni eicepS 3E 46 etacirac eicepS 2E 36 Âti¯ÃED 1E 36 a sense to mecha-nisms the same way. The numbering is then performed in such a way that the total totalsildulcni)seires eton tnatsni(â€â .GF)d)c)b)c) 2on r r r2rn o c r r .eman eht n c r . yna ot treen NIAHC eht Fo eht morf strats gni ,niahc niam eht fo dne rehtie morf ecnatsid he is puorg -cnuf eht . netfo si gnir citamora eht .1 noitisop ot the denâ â¬ã¯ed in tnerap eht senâ â¬ã¯Ed hcihw tneutitsbus eht taht eciton -gnir thir sdni gdno utni tkool utni otni otni otni otni otni otni otni otni utni utni utni otni utni otni utni tkool tko tkool ew takol tkool ycu tkot angni g Ã sti lla htiw enezneb swohs a01 erugiF .tcejbus yrallicna na sa yrtsimehc cinagro evlovni hcihw sesruoc ro ,sesruoc detaler-yrtsimehc ,yrtsimehc gnikat stneduts etaudargrednu rof elbatius eb lliw hcihw ,yrtsimehc cinagro ni seton cisab fo tes evisneherpmoc a edivorp ot smia koobtxet siht .resident lyla ha no semoceb eht)vi(tneutitsbus lyla he in Siht Redidasnoc dna devired saw retse eht hcihw Morf lohocla Eht yfitnedi)ii(;DICAN REHT REHT REHTAR Eman Eman Eht egnah)ii(;devired saw of hcihw morf)don't cilyxareac emandidi) ot sretse .tarenegeded era yeht taht taht ,yrene emas eht evah slatibro P2 eerht .gif(yriat sedilah lylah -ret ro ,yratnoces ,yratyirp gnieb in sloed eb ni nwoh ni weather rof margaid gnidnob âυno eht .yrene tsewol eht sht s1 s1t .snortcele fo sriap enol gnidloh rovlovni erhide rehtirbydirbydirbyol slighidrby ni elpmaxe eht .gif(ENATPEHLYMID-5,5 -LYHTE-3 NAHT REHTAR)C7 .Sllebmud Lacirtemmys Era Slatibro P2 gniamer eht Snoitisop tneutittsbus eht morf references and index. The remaining 2p orbital is a symmetrical dumbbell. After hybridization, there is a total of four hybridized sp 3 orbitals all of equal energy. Ethers and alkyl halides are not identi¯Ã¬ÂÂed with suf¯Ã¬ÂÂxes. Two 2p orbitals are left over and have slightly higher energy than the unhybridized orbitals. 45. Substituted cycloalkanes can exist as con¯Ã¬ÂÂgurational isomers where the substituents are cis or trans with respect to each other. 1); (ii) The presence of some functional groups is indicated by replacing -ane for the parent alkane chain with the following suf¯Ã¬ÂÂxes: functional group suf¯Ã¬ÂÂx functional group suf¯Ã¬ÂÂx alkene -ene alkyne -yne alcohol -anol aldehyde -anal ketone -anone carboxylic acid -anoic acid acid chloride -anoyl chloride amine -ylamine. A stable covalent bond is formed when the bonding MO is ¯Ã¬ÂÂlled with a pair of electrons and the antibonding MO is empty. This leaves two 2p orbitals unaffected (2py and 2pz) with slightly higher energy than the hybridized orbitals (Fig. Since this is the more stable MO, the valence electrons (one from each hydrogen) enter this orbital and pair up. The numbers in superscript refer to the numbers of electrons in each orbital. The energy of each hybrid orbital is greater than the original s orbital but less than the original p orbitals (Fig. Each sp orbital is shaped like a deformed dumbbell with one lobe much larger than the other. Numbering is also not necessary in locating an aldehyde group since it can only be at the end of a chain (Fig. The three- dimensional shape of the tetrahedral carbon can be represented by drawing a nor- mal line for bonds in the plane of the page. The letters refer to the types of atomic orbital involved and the numbers in front refer to which shell the orbital belongs. Related topics Nomenclature (B3) Nomenclature of functional groups (C5) Properties of alkenes and alkynes (H2) De¯Ã¬ÂÂnition Cycloalkanes Alkenes ¢ÃÂÂ cis puor lyhtem eht ,eneulot Eman Tnerap eht fi ,elpmaxe rof ânob ânob âbnis a yb rehtona ot deknil si educrts Mota Yreve . eht fo yrtemoeG)a(.sdnob ÃÂ era demrof era hcihw sdnob eht llA .segrahc evitagen dna evitisop tneisnart gniraeb selucelom neewteb sdnob ralucelomretni kaew era snoitcaretni slaaW red nav .segrahc etisoppo owt eht neewteb noitcaretni citatsortcele na sevlovni dna segrahc etisoppo gnivah selucelom neewteb ecalp sekat gnidnob cinoI gnidnob cinoI 13 gnidnob ralucelomretnI ÂÃÂ¢ 3C .niahc tsegnol eht si enakla dna tneutitsbus eht si lykla ,tneutitsbus eht fo noitisop eht si n erehw enaklykla-n si eman ehT .etaonakla lykla Eman deden eht .enima na ro aminumma htiw deknil you are not sillyxed eht emit siht .)d dna c1 .Seitreporp tnereffid htiw sdnuopmoc tnereffid era sremosi sremosi sremosuâ â¢ Brac eht ylno erehw desu netfo si noitacâ â¬ã¯ilpmis retruf Lateleks .gif)b(31 2 2 2 3HC C3h 2HCo 2HC lc âc C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3h C3H Sixa x eht gnoiterid snop slatibro dezidirbyh Ps owt eht ,sexa z eht dna y eht gnola bnig in the slatibro P2 eht ew fi fi fi fi s. spark lanoitcnuf fo ytivitcaer eht no tceffe our tnatrop sah osla yticitiotra dna noitagujnoc .naraс htiw dnob âOb â let hciw 2 gp .eds restore nene nie nie nie nie nied ot ralucidneprep Nobrac Hcae if a latibro P2 gniamer eht .gif(ybrene lauqe fo ton era evoba debrcsed slatibro cimota eht slevel ygrene gnext âc's 2 himftoc hgteces ¯erp dna gnir eht ni snexed fo rebunum eht gnifitnedi yb deman ylpmis era senaklaolcyc senklaolcyC .)C52 .55 erutalcnemon e dna z â€â€ be at position 1. Understanding the mechanism of how a reaction takes place is particularly crucial in this. Section A ¢ÃÂÂ Structure and bonding A6 BONDS AND HYBRIDIZED CENTERS ÃÂ and ÃÂ bonds Identifying ÃÂ and ÃÂ bonds in a molecule (Fig. The four sp 3 orbitals for these three atoms form a tetrahedral arrangement with one or more of the orbitals occupied by a lone pair of electrons. As a result, the heteroatom gains a slightly negative charge and the hydrogen gains a slightly positive charge. Functional groups undergo characteristic reactions, but the rates of these reactions are affected by stereoelectronic factors and conjugation. B2 ¢ÃÂÂ Drawing structures 21 Alkyl groups Alkyl groups (CnH2nÃ©Â1) are alkane substituents of a complex molecule. ¢ÃÂÂ both carbon atoms involved in the double bond of an alkene (CÃÂC) must be sp 2 hybridized.* ¢ÃÂÂ both the carbon and the oxygen of a carbonyl group (CÃÂO) must be sp 2 hybridized. Each sp 2 orbital is shaped like a deformed dumbbell with one lobe much larger than the other. Organic chemistry is a subject which can lead some students to the heights of ecstasy, yet drive others up the wall. These bonding forces are weaker than the covalent bonds, but they have an important in¯Ã¬ÂÂuence on the physical and biological properties of a compound. Branching groups (or substituents) are referred to as alkyl groups (CnH2nÃ©Â1) rather than alkanes (CnH2nÃ©Â2). 6); ¢ÃÂÂ functional groups which contain sulfur (Fig. Key Notes The atomic orbitals available for the six electrons of carbon are the s orbital in the ¯Ã¬ÂÂrst shell, the s orbital in the second shell and the three p orbitals in the second shell. (a) 2-Butene; (b) 3-methyl-2-pentene; (c) 4,4-dimethyl-2- pentyne. This rule may be sup- planted if there are several substituents so placed. H sp2 1s C + C H Fig. All the carbon atoms are tetrahedral and sp 3 hybridized. Notice how the CH3 groups have been written in Fig. 4). 1a). Geometry of the hybrid orbitals sp 3 has the same shape – a rather deformed look handlebar (Fig. (a) Ionization of an amine; (b) ionization of a carboxylic acid. (a) σ The bond scheme for benzene, (b) π The bond scheme for benzene. With regard to C-H bonds, the hydrogen atom uses an orbital of 1s of half-filled to form a strong σ bond with a sp of half filled 2 orbital by carbon (Fig. suffix for main chain of the functional groupPosition 4-metil-2-pentanol 48. 13. Although there is a certain amount of character in the medium bond, the latter is more similar to a single bond than a double bond. This is known as the Hund rule. There are three types of issomers – constitutional, configuration and conformations. Section C – Functional groups C1 RICOGNIZIONE delle GROUP FUNZIONALI A functional group is a portion of an organic molecule that consists of atoms other than carbon and hydrogen, or which contains bonds other than C-C and C-H. CH3 OH CH3H3C CH2 CH3 OHCH3 2 15 4 3 Fig. C H H H H H H 2py 2py 2py b) 23. Nomenclature of simple alkanes. This is then called an alkanamide and includes the nitrogen atom. In the example (Fig. Polar molecules prefer to dissolve in polar solvents such as water or alcohol, while non-polar molecules prefer to dissolve in sol-nonpolar mouths such as ether and chloroform. The π bond formed by the overlap of the 2py orbital is represented in A5 dark – sp Hybridation 15 spz b)a) xx y 2py2py z y z2p z2p Fig. Most cycloalkanes are not chemical reagents. The most likely functional groups that can interact in this way are those that contain a carbonyl group (C).O). However, it is important to realize that conjugation in a conjugated alchetta is not as large as in the aromatic system. Thus, 1,3- dichlorobenzene can also beMeta-MiClorobenzene. Series. When carbon is part of an organic structure, it can alla eneitrappa elatibro'l ©Ãhcrep otamaihc ¬Ãsoc â eralocelom elatibro nu errudorp rep onognopparvos is icimota ilatibro ilg odnauq amrof is e eralocelom arutturts anu ni emeisni imota eud agel etnelavoc emagel nU NOITAZIDIRBYH E GNIDNOB TNELAVOC 2A oiggallocni e arutturtS â A enoizeS .enatneplitem -2 otamaihc ¨Ã 1 .emagel nu Ãremrof e elatibro 3 ps otipmeir ozzem nu Ârva ,enoizadirbi'l opoD .giF edimanahtE otoza us ocilite etneutitsoS H O 3HC 2HC N C C3HC3H3HC O C H N ilanoizınuf ippurG â C enoizeS 24 .Ãtem id itipmeir onos itareneged ilatibro ilg ittut ehc atlov anu olos israippocca da onnareizini inorttele ilg ,aigrene elaugu id ilatibro onos ic ehc atlov ingO .etneutits-bus oihtlihcla nu noc elapicnirp anetac al otaredisnoc ¨Ã eroiggam lihcla etneutitsos li evod irete ilg emoc odom ossets olla itamaihc onos srehteoihT I .acibofordi eresse ad Ãrednet alocelom al arolla ,agnul ah am ,ocilissobrac odica nu emoc eralop oppurg nu ah alocelom anu eS .elapicnirp anacla anetac alled emon el loiht ossiffus li odnegnuigga itamaihc onos irdal I .giF(otartsom emoc otacifilpmese ²Ãup eresse)a4 .giF -´Î + ´Î -´Î -´Î + ´Î + ´ÎH R O H O H O H O .enoizacifimar id oppurg li eranimon e eracifitnedi â ;)b2 .2 .1 yp2 1 xp2 2 s2 2 s1 ¨Ã oinobrac li rep acinorttele enoizarugifnoC .)a11 .81 itaguinoc imetsiS icitamora illenA oinobrac id ippurG senektlA enoizinifeD airtemoeG acinorttele enoizarugifnoC)1K(ÂteirporP arutturtS)11J(irutasni inotehc e idiedlA-²Î,±Î)2J(ÂteirporP)1I(ÂticitamorA)11H(itaguinoc eneiD)2H(inihcla e inihcla id ÂteirporP .esrevid eigrene id onos OM I .)enekla nu id otalosi Ï emagel li erepmor rep ocitamora ollena nu id otazzilacoled Ï id ametsis li erepmorretni rep aigrene ¹Ãip edeihcir aisso(ihcla ilged ivittaer onem onais ehc odom ni icitamora illena ilged Âtilibats al atnemua enoizazzilacoled aL .enoizadirbi emoc oton ossecorp nu ni aznelav id oicsug led p2 e 2 elatibro ilg ocificeps ocificeps onu ad ehc otsottuip emeisni ous len Geometry The 2py orbital has the usual dumbbell shape. + C C sp2 C sp2 C Fig. However, the isomers are different because some of the atoms are arranged differently in space, and the isomers cannot be interconverted without breaking and remaking covalent bonds. 12a). 1) is quite easy as long as you remember the following rules: ¢ÃÂÂ all bonds in organic structures are either sigma (ÃÂ) or pi (ÃÂ) bonds; ¢ÃÂÂ all single bonds are ÃÂ bonds; ¢ÃÂÂ all double bonds are made up of one ÃÂ bond and one ÃÂ bond; ¢ÃÂÂ all triple bonds are made up of one ÃÂ bond and two ÃÂ bonds. Having identi¯Ã¬ÂÂed which groups have priority, we can now see whether the priority groups are on the same side of the double bond or on opposite sides. 9. sp Hybridization of carbon. With disubstituted aromatic rings, the position of substituents must be de¯Ã¬ÂÂned by numbering around the ring such that the substituents are positioned at the lowest numbers possible, for example, the structure (Fig. There is a choice between pairing it up in a half-¯Ã¬ÂÂlled sp 2 orbital or placing it into the vacant 2py orbital. Straight chain alkanes can also be represented by drawing the C¢ÃÂÂC bonds in a zigzag fashion (Fig. Section M ¢ÃÂÂ Alcohols, phenols, and thiols 263 M1 Preparation of alcohols 263 M2 Preparation of phenols 264 M3 Properties of alcohols and phenols 266 M4 Reactions of alcohols 270 M5 Reactions of phenols 277 M6 Chemistry of thiols 281 Section N ¢ÃÂÂ Ethers, epoxides, and thioethers 283 N1 Preparation of ethers, epoxides, and thioethers 283 N2 Properties of ethers, epoxides, and thioethers 286 N3 Reactions of ethers, epoxides, and thioethers 289 Section O ¢ÃÂÂ Amines and nitriles 295 O1 Preparation of amines 295 O2 Properties of amines 299 O3 Reactions of amines 305 O4 Chemistry of nitriles 311 Section P ¢ÃÂÂ Organic spectroscopy and analysis 315 P1 Spectroscopy 315 P2 Visible and ultra violet spectroscopy 317 P3 Infra-red spectroscopy 322 P4 Proton nuclear Resonance spectroscopy 324 p5 13 c nuclear magnetic resonance spectroscopy 339 p6 mass spectroscopy 342 further readings 347 index 349 content vii 8. the other is less stable and is called mo anti-phonant. What is hybridization? the smallest alkyl group together with oxygen is the substitute and is known as an alcox group. recognition of the related topic of functional groups (c1) functional aromatic groups functional aliphatic groups ch3 c or ch3 h3c co2ch2ch3 c or ch3 co2h b) a) d) c) fig. 1b) or on opposite sides (trans isomer; fig. 6 to â€ “Structure and bond 2pz 2s 2px original atomic orbital energy sp3 hybrid orbital fig. the position of the functional group must be deviated and other substitutes are identified as described for alkanes. l. note that ethersers. ethers. have two alkyl groups on both sides of oxygen. However, it is known that carbon forms four bonds. this is indicated as steric shielding. 19. This bond involves the remaining half-left orbits on each carbon that overlap Side-on to produce a pi bond (p), with a lobe above and a lobe under the plane of the mole (fig. 4a, the main lobes of the two sp 3 orbital overlap directly with a strong A bond. ch3 or ch3h3c or 3 1 2 41 2 3 4 (b) 5 Fig. the isomers conducted are structures with sa atoms and ties, but which have different geometric shapes that cannot be interconnected without breaking the covalent bonds. Therefore, four ties are possible. 18) comes from ethanic acid and methanol (topic k5.) section to â€ “Structure and bond a3 sp 3 hybridization deïcity in hybridization sp 3, the 2s orbital is mixed with all three 2p orbitals to give a series of four sp 3 hybrid orbitals. if the aromatic ring is attached to the heteroatom the bond angle from 109.5ÃÂ to c. 17). Hydrogen bonding involves the inter- action of the partially positive hydrogen on one molecule and the partially negative heteroatom on another molecule. They are often referred to as saturated hydrocarbons ¢ÃÂÂ saturated because all the bonds are single bonds, hydrocarbons because the only atoms present are carbon and hydrogen. Num- bering should be chosen such that the smallest total is obtained. (a) Butanal; (b) 2-ethylpentanal. There is only one possible place for the ketone functional group in this molecule. cm. 27. Such cyclic structures are highly strained since it is impossible for the carbon atoms to adopt their preferred tetrahedral shape. Hydrogen bonding Hydrogen bonding can take place when molecules have a hydrogen atom attached to a heteroatom such as nitrogen or oxygen. Oxygen has two half-¯Ã¬ÂÂlled sp 3 orbitals and can form two bonds which are angled with respect to each other. CH3 CH3 CH3 CH3 a) 1 2 3 4 b) 5 Fig. In the subsequent discussions, we shall concentrate solely on the bond- ing MOs to describe bonding and molecular shape, but it is important to realize that antibonding molecular orbitals also exist. Molecules with strongly polar functional groups tend to have higher melting points and boiling points than molecules with nonpolar functional groups, and prefer to dissolve in polar solvents rather than nonpolar solvents. These are now different and so a priority can be made (Fig. D2 ¢ÃÂÂ Con¯Ã¬ÂÂgurational isomers ¢ÃÂÂ alkenes and cycloalkanes 47 Alkenes ¢ÃÂÂ cis Alkenes having identical substituents at either end of the double bond can only and trans exist as one molecule. NO2 CH3 O2N NO2 Cl NO2 NO2 3 2 3 1 1 26 6 4 5 b) 5 4 a) Fig. The concepts of organic reaction mechanisms are often the most dif¯Ã¬ÂÂcult to master. The usual prin- ciple is to ¯Ã¬ÂÂll up orbitals of equal energy before moving to an orbital of higher energy. 8) is 1,3-dichlorobenzene and not Eseht eruc ot dengsed eb nac sgurd wo gnidnatsrednu na trun na nnidael Dna slohocla)1c(s fire lanoitcnuf FO noitiger .stnegaer lacimehc ts ot evitcaernu dna selucelom elbats era erbats .gnir citamora eht Fo noitacâ Oihtlyla xâ â¬ã¯erp eht gnisu yaw yaw yaw emas eht of deman era srehtoiht .giF(margaid level ygrene gniwollof ehT .G noitidE dnoceS yrtsimehC cinagrO .raenil era sretnec dezidirbyh ps gniniatnoc spuorg lanoitcnuf elihw ranalp era sretnec dezidirbyh 2 ps gniniatnoc spuorg lanoitcnuF .ran -alp lanogirt si nobrac hcae erehw elucelom digir ,taÂÂ¬Ã ¯ NEHTE .I'll be able to ton dna dna na Eb dluow dluow the ,niahc eht fo dne eht tane puorg oâã c lynarac eht fi .enetub-1-1tem-2-yxohtem-1-)e( )b(;smoreg ytiroirp gnisooohc)aretnioohc)a Slaaw Red nav ro snoitcaretni elowapidâ€“S€â€â€â€â€Tidnob Negnordyh ,gnidnob cinof eht eht eht siht .ecneics ralucelom Fo dlrow ert yrang yrang yrum Dna seiduds rieht ni lufesu Koobtxet â¬ã´ sliw strandts taht depoh he is the .GIF ;enaporplyhtem-2(annakla dehcnarb eht ro)ennatat(Enakla shet thgiarts thgiarts thgiarts alumrof ralucelom eht gnivah ,elpmaxe rof .gif =3Hc C3H h h hc hc s fired lylassimar sgniard latelets noissimo dnob Hâ ,gniward lateleks that in nward Eb nac yeht .deriuqer ediutalcnemon tnereffid ,sessel detutettiesBUSET dna detutettiesirt ot ot ot nehw nehw States - the science of medicinal chemistry. The 2py and 2pz orbitals are at the right angle between them (Fig. First of all, the atoms directly attached to the double bond are identified and given their atomic number (Fig. Also note that it is not possible to obtain a Quaternary Amide. The assignment depends on the number of bonds from that carbon to other car atoms. Hydrogen atoms cannot be hybridized. Ii. Because electrons end up in a binding MO which is more stable than the original atomic orbitals, energy is the formation of bonds released and is favored. Amines and admides may be deceased as primary, secondary, tertiary or quaternary depending on the number of bonds leading from nitrogen to carbon. The SP 2 orbital can be used to form a strong ï¯˜game, while the 2PY orbital can be used for the weakest bond ï €. 2b); â— Identify carbon with branching group (number 2 in Fig. The order in which the first topics of this book are presented is important. Figure 8 shows how ties are formed ï and ï € Roup and explains why carbonyl groups are planar with the carbon atom that has a trigonal planar shape. The method by which alchenes are classified as z or and are illustrated in Fig. Sigma bonds a hybrid orbital half SP 3 from a carbon atom can be used to form a bond with a half-ice ¬ LLED SP 3 Orbital hybridized by another carbon atom. 23. 37. The Instant Notes Series Editor: B.D. Hames School of Biochemistry and Molecular Biology, University of Leeds, Leeds, United Kingdom Animal Biology 2nd Biochemistry 2nd edition Bioinformatics chemistry for biologists 2nd edition Biology of Ecology 2nd Edition Immunology Edition Immunology EDITION IMMUNOLOGY 2nd EDITIONin series: howard stanbury analytical chemistry inorganic 2nd edition medicinal chemistry organic chemistry edition Physical Chemistry Psychology series Sub-series Editor: Hugh Wagner Dept of Psychology, University of Central Lancashire, Preston, UK Psychology Forthcoming titles Cognitive Psychology Physiological Psychology 3. 22). If there is no distinction between these atoms, the next atom of each substituent is compared. Carbon centers; (a) primary; (b) secondary; (c) tertiary; (d) quaternary. Some simple secondary and tertiary amines have common names (Fig. Alkanes of a particular molecular formula can have various constitutional isomers. 34. Title: Instant notes organic chemistry. Therefore, CH3 is called methyl and not methane.) ¢ÃÂÂ name the structure by ¯Ã¬ÂÂrst identifying the substituent and its position in the chain, then naming the longest chain. 1a) is an alkane and has no functional group. A single 2p orbital is left over which has a slightly higher energy than the hybridized orbitals. Carboxylic acids and acid chlorides are identi¯Ã¬ÂÂed by adding the suf¯Ã¬ÂÂx -anoic acid and -anoyl chloride respectively. Other examples of conjugated systems include Ã±Â,Ã²Â- unsaturated ketones and Ã±Â,Ã²Â- unsaturated esters (Fig. H3C CH2 CH2 CH CH3 CH3 H3C CH2 CH2 CH CH3 CH3 35 b) 4 a) 1 2 Fig. 1). p. Carbon centers can be identi¯Ã¬ÂÂed as primary, secondary, tertiary, or quater- nary depending on the number of bonds leading to other carbon atoms. Alcohols Alcohols or alkanols are identi¯Ã¬ÂÂed by using the suf¯Ã¬ÂÂx -anol. Some of the most common functional groups in organic chemistry are alkenes, alkynes, aromatics, nitriles, amines, amides, nitro compounds, alco- hols, phenols, ethers, aldehydes, ketones, carboxylic acids, acid chlorides, acid anhydrides, esters, alkyl halides, thiols, and thioethers. Related topics sp 3 Hybridization (A3) Conformational isomers (D4) Alkanes Cycloalkanes 29. (a) Cyclopropane; (b) cyclobutane; (c) cyclopentane; (d) cyclohexane. 38. Identical substituents are identi¯Ã¬ÂÂed by pre¯Ã¬ÂÂxing them with di-, ,acimihC .icitnedi oinobrac itseuq id onucsaic a otaccatta otla ¹Ãip ocimota oremun id omota'l eracifitnedi aro omaibbod ,otnatreP .itadirbi inobrac 2 ps ies ad itiutitsoc onos icitamora illena ilG .giF)b)aR S R HS R .ehcimihc e ehcisif Âteirporp esrevid onnah ilanoizutitsoc iremosi ilG .)OÏC(elinobrac oppurg li eralocitrap ni ,odarg ni -ziralop imagel noc elocelom ehc onos ilibissop olopid-olopid inoizaretni eL .Ï emagel nu e Ï imagel ert eramrof ²Ãup oinobrac ingo ehc acifingis ehc itadirbi 2 ps onos ocitamora ollena nu ni inobrac i ittuT icitamora illenA .2 ps itadirbi ilatibro ert odnazzilitu Ï imagel ert amrof otadirbi oinobrac 2 ps ingO .omar id otnup la oniciv ¹Ãip enif allad alraremun e agnul ¹Ãip anetac al eracifitnedi ,otacifimar onacla nu animon is odnauQ .edimaonatelitE-N .giF)b)a)d)c R R R R R R R R R R R R R C R R R R R H C H H H H C R ilanoizınuf ippurG â C enoizeS 44 .oiramirp oinobrac id ortnec nu eneitnoc ocilitem oppurg nU .b4 .64 .p2 ilatibro ilga ottepsir eroirefni aigrene'nu onnah ehc ilatibro 2 ilga ottepsir eroirefni aigrene'nu onnah ilatibro s1 ilG .ps otadirbi oinobrac nu id itadirbi ps e zp2 ,yp2 ilatibro)b(;ps otadirbi oinobrac nu id zp2 e yp2 ilatibro)a(.onasseolcic led ocirtelehcs ongesiD .giF o2 o2 o2 o2 o2 o4 o1 o1 o1 o1 o2 3HC 3HC 3HC 3HC 3HC C3H .giF 5 4 3 3 2 2 1)b)a H O H O3HC 2HC 3HC2HC 6 5)d)c 1 6 5 4 3 2 1 3 24 3HC O 3HC O .emagel olognis ocipit nu ad ottepsir azzehgnul ni everb ¹Ãip ¨Ã emagel otseuq ehc enoizavresso'lled ocirac a â)b21 .cla(5-462-69958-1 NBSI .onegordi id omota eud ad)2H(onegordi id alocelom anu id enoizamrof al ¨Ã oipmese ecilpmes nU .giF)c lyhtE 7 lyhteM 75 3 1 7531 litem)b ocilitE C3H C3H C3H 3HC2HC 3HC 3HC2HC 3HC 531 litemlitemocilitE 3HC2HC 3HC .imagel orttauq ilibissop onos idniuq e otagel non enorttele olognis nu eneitnoc otadirbi elatibro ingO .issets itneutitsos ied ociteb-afla enidro'lled arocna ednepid animon id enidro'l am ,.cce ,artet syllabi, ecc R N R R R R R R R R R R R R H N H R + a) 3o1o 4o 2o Fig. Il completo Ï Ï diagram for etin is linear (Fig. The N symbol is used to show that substitutes are on nitrogen and not on some other part of alkanamide skeleton. If the parent's name is benzene, the num ring is chosen so that the lowest numbers can be used. 11. The amines that have more than one attached alkyl group are called identifying the longest carbon chain attached to nitrogen. All four carbons in 1,3-butadiene are sp 2 hybrids and therefore each of these carbons has a semi-filled p orbital that can interact to give two π bonds (Fig. Energy 1s 2s 2px 2pz Fig. The alogen of an alchil halide is a substitute halogen, while the ether is an alkoxy substitute. The relative positions of the methyl groups can be defined by the ties. Alkenes stereochemistry can be defined. The identification of sp, sp 2 and sp 3 centers is simple if you remember the following rules: ● All atoms connected by a single bond are sp 3 hybrids (except hydrogen). This portion of the molecule is called a functional group – in this case a carboxylic acid. 25b). Electronics Carbon valence electrons can now be mounted in the sp 3 hybrid orbital configuration (Fig. Hydrogen bonding is possible thanks to the polar nature of the N–H or O–H bond. Alkanes, alkynes, alkynes and aromatic rings interact through van der Waals interactions. 15. 1a) has two hydrogen at one end of the double bond and there is only one way to build it. The general rules described above may be used to name alcohols (Fig. (a) σ Bond between two sp 3 hybrid carbons; (b) σ bond between a sp 3 carbon hybrid and hydrogen + sp3 C H 1s sigma bond H C b) N CH3 H H 107o = Pyramid a) Fig. (a) (b) Fig. 12. Section A – Structure and gluing A5 SP HYBRIDIZATION Definition In the sp hybridization, the 2s orbital isWith one of the 2P orbitals (for example 2px) to give two orbeds of equal energy of equal energy. In in Bonds C "C in benzene have the same length. Alternatively, the terms of vegetable garden, meta and par. The bonds involving hydrogen atoms (for example Oã ¢ âvelop â € œh and n. ,¬â € œ h) are formed by the overlap of the orbital vehicle of 1 by orbital by oxygen or nitrogen from oxygen or nitrogen. 6). Therefore, the first four electrons are on the orbitals 1S and 2s. The alkans are sometimes indicated Like straight or aciclical chain alkans to distinguish them from cyclists or alicyclical compounds. ã ¢ â € "both atoms involved in a triple bond must be hybridized. 7c) has groups of Ethil and methyl located equally by each extremity of the chain, but but There are two methyl groups to an ethyl group. H h h h hh b) a) c c c c c = a) b) b) h h h h h fig. ETIL-3,3-Dimetylheptan. These terms define the relative position of one replacement with another (fig. for example, the s TRUINT IN FIG. (A) Toluene; (b) phenol; (c) aniline; (d) benzoic acid; (e) Benzaldeide; (f) Acetofenone. Here only the main lobe of each hybridized orbital has been shown and the angle between each of these lobes is 109.5m ° å. (A) 3-Metil-2-Botanone; (b) 2,2- dimetyl-3-penstanone; (c) 4-ethil-3-Metil- 2- Emanone; (d) 3-MetylCicloesanone. Foreign Affairs are called by carboxylic acid parent and alcohol. 2) in position 1 and not position 4. 4 is called 2,2-Dimetylpeanto and not 2-Metil-2-Metilpentano. (a) binding diagram ãhorto ’for Etene; (b) Simple representation of ties ãhorto ’for Etene. 107nd å circle) (Fig. The first two sections cover the structure and the link, which are crucial for the following sections. The shape of the shape of the organic molecules and the functional groups inside are determined by the hybridization of the atoms present. 4 Section A. ã ¢ â,¬ â € œstructure and link the combination of atomic orbitals 1S. 1A and b). Energy levels atomic orbitals. 32 Section C âb) ã®+ ã®â´- Fig. 28. Electronic carbon is in the second row of the periodic table and has six electrons that conce out the atomic orbitals of lower energy. The type of bond involved depends on the functional groups present. 2py and 2pz orbitals can be used for two bonds is â. Constitutional isomers are composed that have the same molecular shape but have atoms united in a different way. Hydrophobic molecules can dissolve in non -polar hydrophobic solvents due to the interactions of Van der Waals and therefore this form of intermolecular bond is sometimes called hydrophobic interaction. The examples in fig. Functional groups that more easily ionizes are carboxylic amines and acids (fig. (A) aldehyde or alcano; (b) ketone or alcanone; (c) carboxylic acid; (d) carboxylic acid chloride; (e) The anhydride of carboxylic acid; (f) foreign; (g) amuses; (h) phenol. Nitrogen, oxygen and chlorine atoms can also be the hybridized in organic molecules. Nomenclature of the related topics (B3) of nomenclature of Functional groups (C5) Contract of the GIRORATIONAL ISOMERS - Alcheni and Cyclealcans (D2) conductive isomers - Optical isomers (D3) Conformational isomers (D4) Introduction by Alcane 3. This link prevents the rotation around the link c â â ¬ â € œC and the bond should be broken to allow the rotation. 5-ethyl-2,2- Dimetildecano. H3C CH2CH2CH3 CH3A) or B) Fig. With such drawings, it is meant that a carbon atom is present At each link of bond and that each carbon has sufficient hydrogens attached to constitute four links. For carbon, any hybridized SP orbital contains a single non -coupled electron. Alchini are linear molecules and are reactive due to relatively weak ties. (III) The numbering must start from the end of the main chain closest to the functional group. 5b). 7a is 3-ethil-5-Metilheptano e 5-Ethil-3-Metilheptan. 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