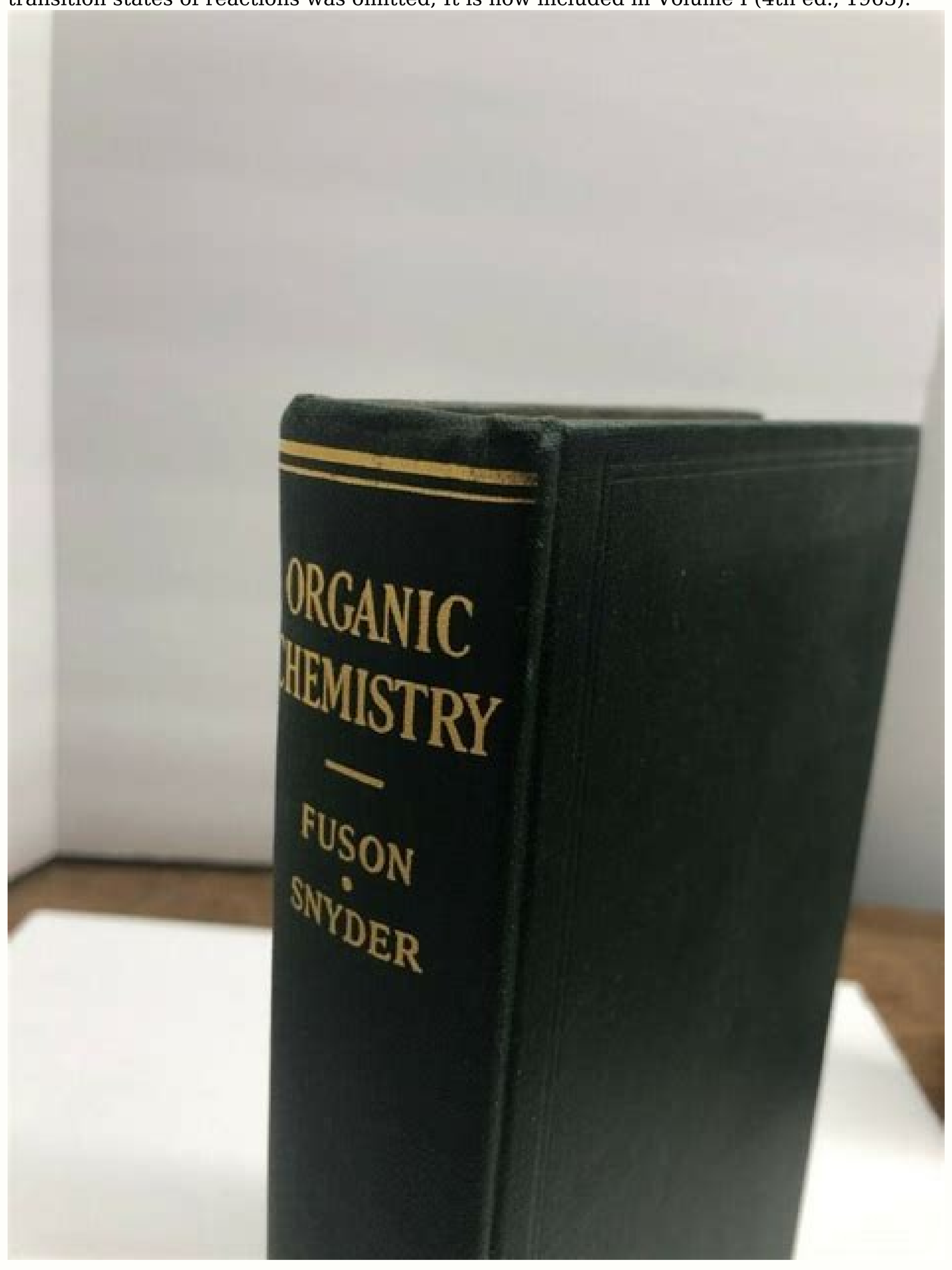
Organic chemistry by il finar volume 2 pdf

Organic Chemistry Vol 2Stereochemistry and the chemistry of Natural ProductsAutoren: I L FinarInhaltsverzeichnisPhysikalische Eigenschaften und chemische KonstitutionOptische IsomerieNukleophile Substitution an einem gesättigten KohlenstoffatomGeometrische IsomerieStereochemie von DiphenylverbindungenStereochemie einiger Elemente außer KohlenstoffKohlenhydrateTerpeneCarotinoidePolyzyklische aromatische KohlenwasserstoffeSteroideHeterozyklische Verbindungen mit zwei oder mehr HeteroatomenAminosäuren und ProteineAlkaloideAnthocyanePurine Säuren, Vitamine, Chemotherapie, Hämoglobin, Chlorophyll und Phthalocyanine. This was made possible by the insights I drew from articles written by experts about important advances in their fields of research.
The breadth of published research on the issues covered (and not covered) in this book makes it impossible for any new work to be done, so I had to make a decision, but hopefully that's all the shortcomings of my choice. To read the instructions at the end of each chapter. Chapter III was rewritten (and renamed), but the chapter on the theory of transition states of reactions was omitted; It is now included in Volume I (4th ed., 1963).



Zu den erweiterten Themen gehören kernmagnetische Resonanz, Korrelation von Konfigurationen, Konformationsanalyse, molekulare Überfüllung, Beckmann-Umlagerung, nucleophile Substitution and einem gesättitigten Kohlenstoffoffatom, Additionicisreto inn. Einige Additionen sind rotatorisch Dispersion, Electronenspinresonanz, Specification of absolute configurations, Newman projection formulas, neighboring group participation, Wagner-Meerwein-Maving, sesquiterpene, etc. File size: 23.4 MB Page: 701. Please read the disclaimer. From Organic Chemistry Vol 2 to I L Finar Third Edition in PDF format from the download links below.
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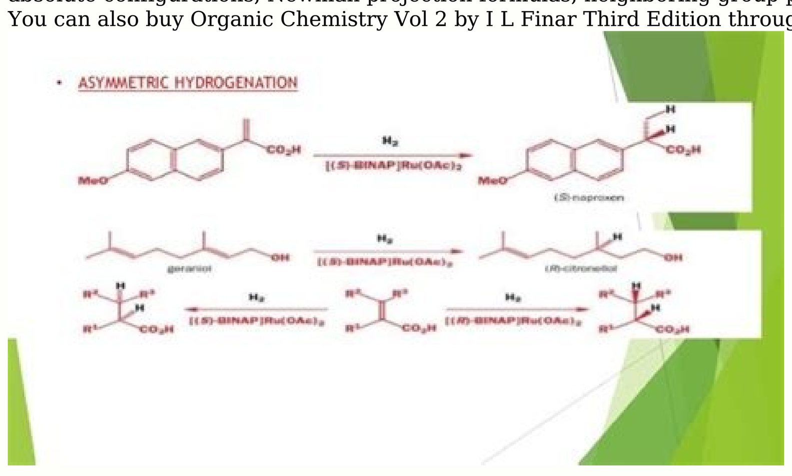

Email subscription area sidebar (for PC) and moreAcidvitamineminemineMinemotherapymoglobin enables the chlorophyll index and the Falocianin indexing the third edition This third edition has been checked to update it. This was made possible by the information I received from articles that have been written by experts in important development in their research area. Since the research volume on topics that dealt with in this book (and untreated) became the end of each chapter. Chapter III was rewritten (and renamed), but part of the reaction theory of transition status was omitted; It was now included in Volume I (4a Ed., 1963). Extended topics include the presentation of core magnetic resonance imaging, correlations of the configuration, configuration analysis, molecular audience, Beckmann, nucleophilic replacement in the case of saturated carbon atom, elimination and increment reactions, carotenoids, penicillin, amino acids, biosynthesis, etc. Projection formulas, participation in the surrounding groups, re -grouping Wagner Meerwein, Sesquiterpenen etc. File size: 23.4 MB site: 701. Please read the exclusion of responsibility. You can also buy an organic chemistry Vol 2 Z i l Finar third edition from Amazon by clicking on the picture below to download hundreds of chemical books in PDF from - here.) and new updates. The beauty of an email subscription is available in the sidebar (for PC) and it is availableBelow this article (for Android devices). Our social network pages like the maximum number of people so that as many people as possible can use this public service! Download links work / don't work, leave a comment below so we can update the download link. Natural Products Chemistry Writers: I L Fınar Fişsel Properties and Chemical Structure Optical Isomeria Nucleophilic Saturated Carbon Atomic Change Geometric Isomerism Stereochemical Carbon Aromatic Sterilization Carbon Aromatic Aromatic Compounds of some stereoochemistry and more heteroochemical and more anchors and more. anchor. Nucleic Acids Vitamins Chemiot Hemoglobin Chlorophyll and Ftalociana Author Index Third Edition Index Prequar This third edition has been revised to be current. This has become possible because of the information I have received from articles written by experts about important research changes. Since the scope of research on the issues discussed in this book did not allow all new studies to be included, I had to choose, but my selection deficiencies were partially compensated. Read the links at the end of each chapter. Chapter III was rewritten (renamed), but the transitional state is omitted through reactionary theory; He is now part of Volume I (4th edition, 1963). Expanded topics include nuclear magnetic resonance imaging, configuration correlation, comfort analysis, molecular excess world, beckmann reconstruction, nucleophilic replacement in satome satome, elimination and other reactions, carotenoids, penicillin, amino acids, biosynthesis, etc. Dispersion, resonance of electron rotation, specification of absolute configurations, newman projection formulas, participation of adjacent groups, Wagner Meerwein reorganization, Seskwiterpens and more. File Size: 23.4 MB page: 701. Read Responsibility Refusal.
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By using our site, you agree to collect information using cookies. Read our Privacy Policy for more information. 1. Longman, Green and Co Ltd 48 Grosvenor Street, London W.L Second and third editions of companies, associated companies and representatives around the world - © /. L.
Finar, 1959 and 1964, first announced 19S6 Second 1958.
The impression of the second edition. Second 1960 Struck - Third 1964 Permission. 2. Leeds Teachers' College Library. ACC 31 Jum 1865 'Class ...... F4L BIG PressButler & Tanner Ltd, Fent and London Preface to the third edition, the third edition has been improved and updated.
This became possible due to the fact that I received from 3 articles written by 3 experts on important events in their field of research. Because the field of research on topics raised (and intact) in this book was published, it does not allow us to include all new works, so I had to choose, but my choice, I hope that references to reading chapters partially compensate. Chapter III was prescribed (and renamed), but the Department of State for transitional response was omitted; It is now contained in it (edition 4, 1963 4). , Formula of the prediction of NewMen, resonance of the participation of a group of neighbors, specification of absolute configuration, formula of prediction of new men, participation of a group of neighbors. Reservation. I. L. Final, Preface to the second edition, this volume is now improved, this volume is now improved, this volume is now improved, this volume is now improved, this volume is now improved. Collect it with modern requirements. ; This included the expansion of some departments and adding new material.

1916) prepared the benzenesulphonate of benzophenone oxime and showed that this readily underwent rearrangement in neutral solvents in the absence of any acid catalyst to give an isomeric compound which, on hydrolysis, gave benzanilide and benzenesulphonic acid; thus:

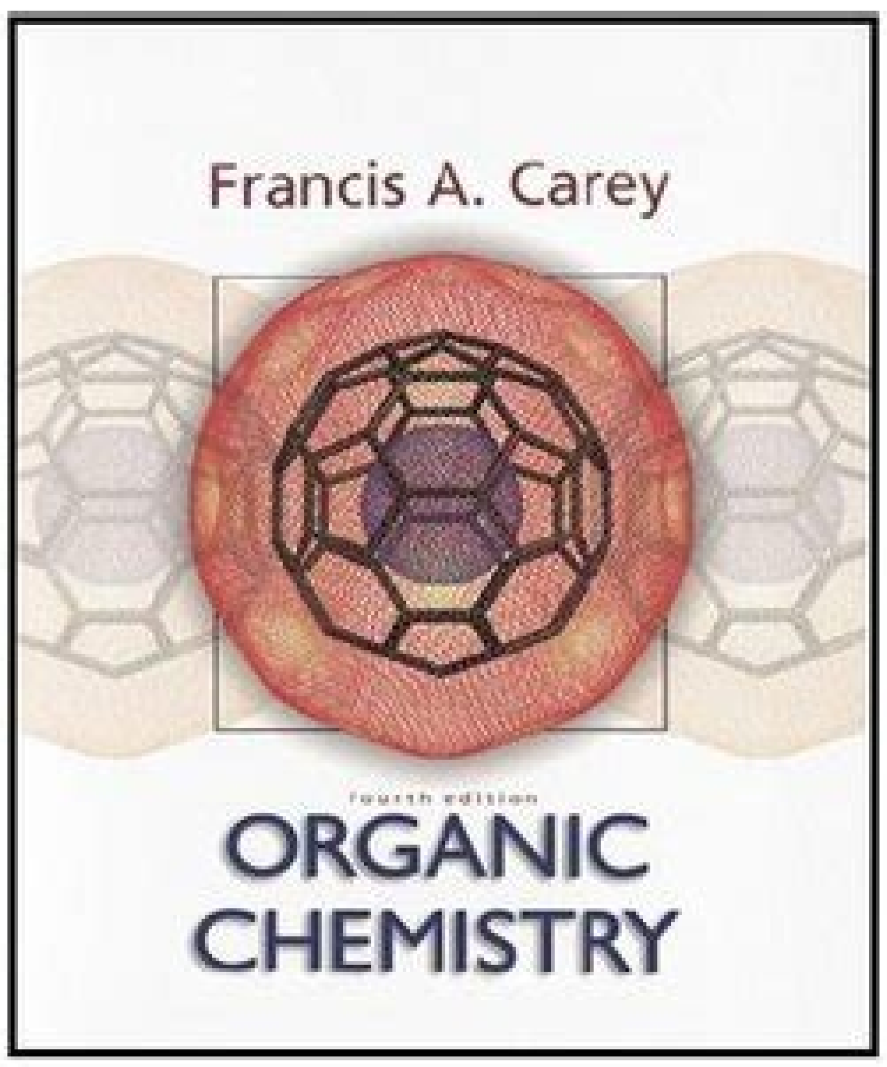
Ph Ph Ph-CONHPh

Ph-C=N -> Ph-C=N *2*$. +

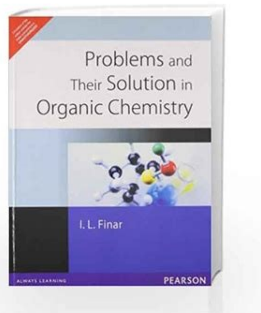
OSO.-Ph OSO.-Ph Ph-SO,H

Kuhara assigned structure I to this

It may be helpful to briefly indicate the most important changes in this new edition. The two main add -ons are appropriate analysis and biosynthesis: in each case I will contribute to the problem, and discuss 6.
Different programs. Some other supplements include nuclear magnetic resonance imaging, configuration correlation, stumps and vitamin B 12. Extended topics include dipole moments, molecules rotation, optical isomeria, steri effects (including steric factors and transitional condition), cholesterol synthesis, polypeptides of vitamin A1 (polypeptides, polypeptides, polypeptides Mechanism Activity of enzymes, fiavon and streptomycin). And Paulina.



I would like to thank these commentators and correspondents who pointed out errors and suggested improving the book. , ed. 2), I am of the opinion that the chemistry of natural productsApplying the principles of organic chemistry. In this sense, this work builds on my previous. I am convinced that the 8th grade pupil who controls the rules is good in programming as soon as he begins to learn. At the same time, the student attracts the student to Faraday: "CE N'est Pas Assez de Savoir Les Principles, Il Faut Savoir Mani-Puler" (quoted Faradayem of Dictionnaire de Trevoux). In the stereochemistry section I do not expect previous knowledge in this area. This meant a certain repetition of material from my previous book, but I thought it would be a better way to process this type of topic, because an alternative to continuity would be to do it. I refrained the presentation of the stereochemistry of coordinated compounds because this topic is included in the textbooks of inorganic chemistry. Part of natural products in this book was a lot of problems. I tried to give a general link to the issue discussed and basically chose the most common combinations for a relatively detailed discussion. At the same time, I believe that the topic 10, which is discussed, should be a good introduction to organic chemistry that students who have read part of II chemistry at the University of London need to honor. At the end of each chapter, I have included the selected number of readings that students can expand and compensate for any repairs I have made. For monographs, articles, etc.



It is not possible to thank the authors from whom I have received so much information, and I can only hope that some of my thank you I mediated to you will be reflected in the functions. Since physical measurements are very often used to explain the structure of organic compounds, I have included a short chapter on these measurements (Chapter I). In this chapter, I mentioned only a minimum of theory that the student understands the concepts used; The main purpose is to demonstrate the use of physical measurements. Throughout the book, cross references are marked in chapters and sections.
If the 12th chapter refers to another chapter, only the chapter number is stated. It should also be noted that numbers, patterns, etc.applies only to each chapter and does not apply to subsequent chapters of that chapter. Referring to my previous volume, the second volume was titled Volume I. In such cases, pages are not referenced as the page numbering varies from edition to edition. However, the student will not have a problem finding a reference to Part I in the index. 1 Introduction, 1. Van der Waals 14. Forces, 1. Hydrogen Bonding, 2. Melting Point, 3. Boiling Point, 4. Solubility, 4. Viscosity, 5. Molecular Volumes, 5. Parachor, 6. Refractory, 7.
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Nature. Publications on chemicals 33. obshch. Chemical Society Quarterly Scientific Journals (London).
tetrahedron XLL Part I Physical properties and chemical composition §1. login. 34. Many studies have been conducted to elucidate the relationship between physical properties and chemical structure. The ideal situation to be reached is when the chemist can predict with great accuracy the physical properties of an organic compound whose structure is known, or formulate the correct structure of an organic compound from detailed knowledge of its physical properties. In recent years, great progress has been made in this direction, as can easily be seen from an examination of the methods used to elucidate the structure of organic compounds. In the first studies, the structure of the 35th organic compound was completely solved by chemical means. In short, these are: (i) Qualitative analysis. ii) Quantitative analysis leading to an empirical formula. (iii) determination of molecular weight, which determines the molecular formula. (iv) If the molecule is relatively simple, write down various possible structures (based on the valence of carbon being four, hydrogen one, double oxygen 36, etc.). The reactions of the compound are then examined and the structure that best fits the facts is selected. Where the molecules are not quite simple, compounds are examined by special tests to determine the nature of the various groups present (see, for example, Alkaloids, § 4.XIV). Compounds are also broken down and studied into smaller pieces.
This means that a preliminary build can be recommended. v) The final step in elucidating the structure is synthesizing the compound and generally further synthesizing it. 37. The paths are different, the more reliable the structure attributed to this link will be. In recent years, chemists have increasingly used physical properties in addition to purely chemical methods to elucidate the structure of new compounds. In addition, when this information could not be obtained from a chemical, structural information was obtained through physical measurements.Early chemists identified suitable compounds for physical properties such as boiling point, melting point, refraction 38. Index; Nowadays, many other physical properties are also used to describe native connections. This report describes the relationship between physical properties and chemical composition and their application to the problem of chemical structure elucidation. §2. Van der Waals forces.
Ostwald (1910) Physical properties are divided into additive (these properties depend only on the nature of the molecule and the atom), constitutive (these properties depend on the nature, number and position of the molecule) and the nature of collection, number and arrangement. (These properties depend only on the number of molecules present and do not depend on their chemical composition). It is very doubtful whether any of these three classes of properties are entirely independent of one or two, except the molecular weight, which may be regarded as adjuncts really and independently of the other two. The forces between the molecules had a significant influence on the constitutive and collective properties of these properties. Attractive 40.
To explain the cohesion of liquids and solids, the forces between the molecules of the substance must be considered. Ideal gases obey the equation PV = RT, but real gases do not, partly because of the attractive forces between molecules. Van der Waals (1873) was the first to attempt to modify the ideal gas law of real gas behavior that allowed for these attractive forces (introducing the term A/V% to correct for them). These intermolecular forces are now commonly called van der Waals forces, but they are also called residual or secondary valley forces. 41. These forces can be attractive or repulsive; The former explains the cohesion, while the latter must assume that it exists at a short distance, otherwise the molecules will collapse when the intermolecular distances become very small. The van der Waals distances of atoms can approach each other, i.e. i.e. distances where repulsion becomes very large are known as van der Waals radii. Some values (angstrom): H, 1-20; 0.140; N, 1-50; There, 1-80; S, 1-85. These values are very useful 42. In connection with molecules that exhibit a sterile effect, such as substituted protective compounds (§ 2 V). Van der Waals forces are electrostatic. I amWeak forces (ie compared to communication forces), but more than compound elements atoms and molecules. In fact, the more the asymmetrical molecule, the more van-de-pertmains. These forces arise for three different reasons: (i) 43. strength interaction between fixed molecules moments of dipole (Keyuz, 1916, 1921). These forces are known as the effect of keyzoma or dipole-patipolo and depends on the temperature. (Ii) forces caused by a fixed diploma and the interaction between the dipole. Although the molecule does not have a permanent dipole, the dipole can still be caused by adjacent molecules adjacent to a fixed dipole (Debye, 1920, 1921). These forces are known as Debay forces caused by the 44th Dipolas. It does not depend on the dipole or induction effect and almost temperature. (III) London (1930), one of the wave mechanics, showed that the third form of Van-transmission forces also applies. The nucleus and the "electronic cloud" are vibration, and when both atoms are close enough, two core and two electronic clouds tend to vibrate together and cause attractiveness among different molecules. These forces are known as the mechanical effect of London forces, dispersion force or waves and depends on the temperature. 45. It should be noted that the forces caused are less than the other two and the distribution forces are usually the highest. Now the melting temperature, boiling point, viscosity and so on. It is clear that all the physical properties associated with the forces between the molecules, which are mainly determined by the Van-Vitalial. Van-Valid speeds can also be responsible for the creation of molecular complexes (see Vol. I). §3. Hydrogen binding. 46. Particularly important cases of electrostatic attraction are those containing hydrogen binding (Volume I, Part II); This is mainly visible in compounds containing a hydroxyl or group of images. There are two types of hydrogen bonds: between molecules and between molecules.
Changed connection determines a connection that increases the boiling point; It also increases surface tension and viscosity, but reduces dielectric permeability. The binding of hydrogen between molecules can be found in liquid or solid compounds, and its formation is largely 47th molecule, ie spatial or steep factor;W-pentanol is completely bound, while totf.-pentanol is only partially bound.
Intermolecular hydrogen bonds are also responsible for the formation of various molecular compounds and also affect solubility if the compound is able to form hydrogen bonds with a solvent.
Intermolecular hydrogen bonding leads to the chelate, that is, the formation of a circle that usually only occurs when forming 5, 6 or 7-member circles. Chelace is used to clarify the volatility of orthosis, such as O-salonphenols and O-nitrophenols (compared to suitable m-i^-ferrivates). Chelace was also used to explain that different or substituted benzoic acids are stronger acids than the corresponding M and β acids (see Bole I, Chapter XXVIII). When cheel occurs, the formed ring should be flat or nearly flat. If there is another group that prevents the formation of a planning chelate structure, cheraling will be reduced or even inhibited completely (Hunter et al., 1938; see Sterin, vol I, Chapter XXVIII inhibition of resonance). My relationship is chelated, but II is bound and not chelated. The first O-Initrian group can enter a flat circle formation with six CHJCO, CH3CA, HI 50. In II, therefore, a six-person circle of six cannot be formed. Presence of hydrogen bonds, infrared absorption spectrum, X-Ray analysis, electron diffraction, boiling tests, melting temperatures, solubility, etc.
It can be detected by various methods. 51. § 15b).
§4. Melting point. In most permanent bodies, atoms or molecules are in a state of vibration around their solid middle position. These vibrations are caused by thermal energy and their amplitudes are small compared to the distances between the cathodes. As the solid temperature increases, the vibration amplitude and the point at which the crystal structure suddenly becomes unstable increase; This is the melting point. During many peers, the melting temperature of the m 52 limbs is constantly increasing to achieve the maximum value. On the other hand, some homologous sequences alternate or oscillating melting temperature "rule" piła,In the fatty acid series, the "double" acid has a higher melting point than the "odd" acid immediately below and above it.
X-ray analysis showed that this change in melting point depends on the packing of the crystals. The shape of the molecule is closely related to the melting point 53. Point; The more symmetry, the higher the melting point. Therefore, chain branching into isomers (increasing symmetry) generally increases the melting point; In addition, *SRA isomers generally have a higher melting point than cis-, with the former having greater straw symmetry than the latter (cf.
In the benzene series, the derivative of the three substances often has the highest melting point. In addition to the usual van der Waals forces affecting melting temperatures, 54. hydrogen bonding may also play a role, eg the melting point of alcohol is higher than that of the corresponding Alkane. This can be attributed to hydrogen bonding, which is possible in the former but not possible in the latter. Various empirical formulas have been developed to calculate melting points; however, these formulas connect only homologous directory members The mixed melting point method has long been used to describe a compound and is based on the principle that two different compounds mutually lower the melting point of each component component This method is unreliable, however, if a two-component solid solution is formed Hours 5.
Boiling Point Point the boiling point of a liquid is the temperature at which the vapor s input equals the external pressure. Therefore, the boiling point varies with pressure and increases with increasing pressure. In a homologous series, the boiling point of the W terms is usually constant increases, e.g., 56. Kopp (1842), aliphatic alcohols, acids, esters, and so on. and found that the boiling point increased by 19° for every increase in CH2 in the composition. The greater the branching of the carbon chain in the case of isomers, the lower the boiling point. The calculation showed that the boiling point of W-alkanes should be proportional to the number of carbon atoms in the molecule. However, this relationship is not observed in practice and the reason for this deviation awaits clarification. A strongly preferred theory links the reason to 57. The carbon chains of w-alkanes in the liquid phase are mostly helicalThe greater the branching, the tighter the helix, which lowers the boiling point. In aromatic compounds, the ortho isomer has a higher boiling point than the meta isomer, which may have a higher boiling point than the amisomer, but in many cases the boiling points are approximately the same. Since the boiling point depends on van der Waals forces, every 58 structural changes causes the boiling point to change. One such structural change is carbon chain branching (see above).
Another type of change is the replacement of hydrogen with a negative group. This introduces a dipole moment (or increases the value of an existing dipole moment) which increases the attraction between the molecules and therefore raises the boiling point, for example B. Nitroalkanes have much higher boiling points than their corresponding alkanes. The probability of intermolecular hydrogen bonds also increases the boiling point of B, for example. It says alcohols at higher temperatures than their corresponding alkanes. §6. solubility Solubility is assumed to be dependent on the following intermolecular forces: solvent/solute; Solved / Solved; solvent/solvent. The solubility of a non-electrolyte substance in water largely depends on the ability of the compound to form hydrogen bonds with water, for example B.
Alkanes are insoluble or nearly insoluble in water. However, methane is more soluble than all its counterparts. Reason 60 This is unclear; Hydrogen bonds with water are unlikely and therefore B. Other factors such as molecular size must come into play. A useful guide to organic chemistry, "like dissolves like", if appropriate. For example, if a compound contains a hydroxyl group, then the best solvents for that compound often also contain hydroxyl groups (bonds are possible between the solvent and the solute). This "rule" is accepted by many who use the word "like" to mean that the cohesive forces come from the same source in the solvent and the solute, for example B. Alkanes and alkyl logs are mixed; The associative forces of the 61st of these two link groups are largely based on dispersion forces. In some cases the solubility can be attributed, at least in part, to the formation of a bond between a solute such as B. and a solvent in concentrated sulfuric acid to form an oxonium salt (CHJ,OH} + HSO 4 - § 7).
Viscosity of viscosity (flow resistanceOther factors include friction in the fluid, as well as van der Waals forces acting between molecules. Since strength depends on the shape and size of the molecules, the viscosity will also depend on these properties. At the same time, the Kesom forces (§ 2) depend on the temperature, since the viscosity will also depend on the temperature; However, other factors also play a role.
Several relationships have been found between the viscosity of pure liquids and chemical structures, for example (i) in the homologous series, with the molecular weight of viscosity. 63. (ii) The viscosity of the compound with isomers is higher than that of isomers with branched carbon chains. (iii) Abnormal viscosity is determined by the respective fluids. Viscosity measurements were then used to determine the degree of attachment to liquids.
(iv) The viscosity of the FO-AWS compound is higher than that of its corresponding isomer. Equations that relate viscosity to the shape and size of large molecules (macromolecules) in solution have been developed 64 and hence viscosity measurements such as the shape of polysaccharide proteins.
. § 8.
Molecular volumes.
Molecular Volume (VM) V_GRAM Molecular Weight M ~ The density equation in milliliters is given by molecular weight. 65. Since the density of a liquid depends on temperature, a standard temperature must be chosen for comparison. Kopp chose the boiling point of a liquid as his standard temperature. This choice was random, but it turned out that the absolute boiling point at atmospheric pressure of the liquid was lucky to be about two-thirds of the critical temperature, i.e. compared fluids where appropriate; 1879 As a result of his research, Kopp was able to construct Table 66.
Atomic volume based on the assumption that molecular volume is a collection function, e.g. C 11-0 CI 22-8 H 5-5 BR 27 -8 O (0 = 0) 12 -2 12-2 i 37-5 0 (0H) 7-8 Kopp found that oxygen (and sulfur) depend on the combination of atomic volume with atomic volume. Kopp also showed that the molecular volume of a compound can be calculated from the sum of the atomic volumes such as acetone, CH3'Coch3. 3C = 33-0 Molecular weight of acetone = 58 6H = 33-0B.P. = 0-749 o (co) = 12-2 ,. . , 58 .. molecular volume (nable) â tt- ^ tk = 77-4 78-2 [Col.] V; 0-749 68. Additional work has shown that the molecular volume is not strictly additive, but also partially constitutional (such as CSP, which is inclined to ignore this property). If it is purely adhering, isomers have the same molecular volume of a similar structure. It was found that it is, for example, for isomed complex ether, but if isomers belong to different homological ranks, consent may be bad. Later the atomic volume images were compiled with structural changes.
Nevertheless, the connection is heavily divided into 69. Polar liquids in which the attraction between the molecules are so large that the additives (and structural) properties of atomic volume are fully masked. §9. Pachor. Macleod (1923) showed the following equation: y = c (* - da y, where the surface tension is D and G - the density of the liquid or steam, and it is constant, which does not depend on the temperature. The macleod - Equation can be rewritten 70. How: r * c * dl dg sagden (1924) multiplied the two parts of this equation by the molecular mass m and showed that the expression should also have space. Temperature is not too high, D G would be negligible compared to DI, so we have 71. Therefore parachora refers to the molecular volume of the liquid at the temperature, if its surface tension 1 is different liquids it enable us to molecular volumes at the same temperatures to compare if the liquids have the same surface tension. It was carried out under similar conditions. Parahor is essentially an additive property, but also part determined. 1929). The B -Uvo parachute is used to select alternatives. The structures of the structures of I and II were proposed for ^ -Benzokhinon. Most chemical evidence was for I, but the line (1867) proposed II to explain certain properties of this connection (see Volume I). The signature was used to choose between two: [P] Calculated I 233-6; 73. [6 x 9-2 + 4 x 15-4 + 2 x 20 + 419 + 0-8] [p] Calculated for II is 215-4; [6 x 9-2 + 4 x 15-4 + 2x20 + 3x19 + 2x 0-8] [P] is observed at 236-8. This II shows structure II according to Sutton (1952), the parachute is not an appropriate characteristic for the analysis of the molecular structure. However, it is always useful as a physical property of the liquid-spice system.
74. Article 10 radiator. Joshi and Tuli (1951) introduced a new physical constant [F] that they called the cooler. This was obtained by reporting the paracorde [p] to the refractive index (WG>) according to the following equation: [f] = - [p] log " - 1) The authors observed that the refrigerant of everything Composed, that due to the nature of the atoms, other structural factors such as the type of connection, the size of the ring etc. founder. Joshi and Tuli used a coolant to determine the percentage of tautomers in mixtures At equilibrium, for example, they found that ethyl acetoacetate was 7 to 7 %, Enol and Penta-2: 4-Dione of 72-4.
Enol §11. Refraction index. Lorentz and Lorenz (1880) showed simultaneously in A - 1 m, where R is the molecular observer, is not the refractive index, M is the molecular weight of 76 and D is the density. The value of n depends on the wavelength and temperature; D depends on the temperature. It has been shown that molecular rupture has both additive and constitutive properties. In this table, the s atomic and structural cracks in line H have been calculated. Molecular pieces were used to determine the structure of compounds such as terpenes (see § 25. VIII). It was also used to determine the presence of tautomers and calculate the quantity of each form present. Take, for example, ethyl acetoacetate; This acts as the form keto ch3 -â "coch 2 -c0 2 c 2 h b and enol -ch s" c (oh) = ch'c0 2 c 2 h 5. The molecular differences calculated for these forms are as follows: observed for ethyl acetoacetate 31-89 molecular refraction; The two forms are therefore possible. When a compound contains two or more double bonds, the molecular refraction value depends not only on their number but also on their relative position. When the double bonds are combined, incorrect results are obtained, the observed molecular susceptibility is higher than that calculated, for example, the observed value of Hexa-1 is 3:These are 2 to 06 units greater than the estimated value. This anomaly is known as optical exaltation and generally increases with an increase in the length of conjugation (unchanged chains). Although optical exaltation is characterized by acycyclic compounds, it is also found in cyclical compounds. 79. Systems such as benzene, pyridine, pyrole, etc., optical exaltation is light; He was appointed resonance. However, the rise in polycyclic aromatic compounds can be of great importance.
In general, compounds that have high electronic effects are highlighted by a large elevation. Another adaptation of the fracture indicator is its connection to the hydrogen compound. Arshid et al. (1955, 1956) used the fracture index square to detect hydrogen links. §12. Molecular rotation. When 80. The material has the capacity to turn the plane of polarized light of the plane that crosses it, the material is considered to be optically active. The energy rotation energy is measured by a polymeter. If the material turns the polarization plane to the right, that is to say to restore the initial field, the analyzer must be turned to the right (in the hourly direction), it is said that the material turns to the LAW; If on the left (in the antihorarous sense), Ixvorotatery. It has been found that the size of a particular material depends on 81. Many factors: (i) the thickness of the transition layer. The size of the rotation is directly proportional to the length of the active ingredient (Biot, 1835). (Ii) light wavelength.
The rotation power is approximately inversely proportional to the squares of the wavelength (Biot, 1835). There are several exceptions and, in some cases, it has been found that the sign of rotation changes. This change in rotation power as a change in wavelength is known as a rotation dispersion. Therefore, 82. It is necessary to use monochromatic light (compare the power of rotation); The sodium line D (yellow: 5893 a) is one of the most frequently used wavelengths (see also §12a). (Iii) temperature.
The rotation power generally increases with an increase in temperature, but there is, of course, when the rotation power decreases. Therefore, the temperature must be declared for comparison; In practice, measurements are generally made at 20 or 25 °. Iv) Solvant. 83. The nature of the solvent affects rotation, so thisList the solvent used in the spin power range. There appears to be some relationship between the effect of solvent on buckling strength and its consequences. (V) Concentration. The rotation appears to be independent of concentration if the solution is dilute.
However, the rotation of concentrated solutions varies with concentration; The reasons for this have been attributed to association, dissociation or dissolution (see also VI). (Vi) by correcting all the previous factors (I-V), the rotational speed of a given material can be modified by other compounds that are not themselves optically active, such as inorganic salts. In this context, it is important to note that acids or optically active bases in the form of their salts rotate if the solutions are very dilute, despite the optically inactive nature of the ion. In very dilute solutions, the salts dissociate completely and only the optically active ion contributes to the rotation. The spin of the salt formed by the optically active acid and optically active base reaches a constant value in dilute solutions, and the spin is the sum of the spins of the anion and the cation.
This property was used to detect optical activity (see §5a. VI). When recording feature rotations, an optional rotation value, FVL, is usually provided. This is obtained from the equation: [â «i = nrs or h! =; 86. CCX I X C, where i is the thickness of the layer in decimeters, D is the density of the liquid (if it is a pure mixture), C is the number of grams of substance per milliliter of solution (if you are studying a solution), so the observed rotation is the temperature of the wavelength of light used. The solvent should also be specified (see IV). The molecular rotation, TMT, is obtained by multiplying the specific rotation by the molecular weight, 87 M. It is common to divide the results into percentages because the total is usually large; Namely: r _ fal x m l ja 100 The relationship between structure and optical activity will be discussed later (see §â§2, 3. ii). The property of optical activity has been used to study the configuration of molecules and the mechanisms of various reactions, as well as to decide on alternative structures of the compound. The use of optical rotations for structure determination is largely based on 88.Two rules. (i) The rule of optical overlapping (Van't Hoff, 1894): When the compound contains two or more asymmetric centers, it is the overall rotary power of molecules algebraic sum of each asymmetric center. This rule is based on the assumption that the contribution of each asymmetric center is independent of other existing asymmetric centers. However, it was found that the contribution of the asymmetric center was influenced by neighboring centers, as well as the branching and processing of 89 chains. Therefore, this rule, albeit useful, must be read carefully (see also §6.VII).
A more satisfactory rule is the rule of movement (Freudenberg, 1933): If two asymmetric molecules A and B are replaced in the same way to give 'a b', then the differences (see, for example, â§4b. XI). Organic chemistry [chap. I 90. (ii) distance rule (Tschugaev, 1898): The effect of the structural change on the contribution of the center of asymmetry decreases, as well as the center of the change is far from the center of asymmetry. Only asymmetric molecules can, under normal conditions, rotate the polarization plan (polarized light linearly). However, Faraday (1845) found that any transparent material could rotate its polarization plan if it is placed in a strong magnetic field. This feature of magnetic optical rotation (91. Faraday effect) is mainly additive, but also partially constitutive. §12a. Rotating scattering. In Section 12, we discussed the method of optical rotation using monochrome rotations. However, there is also a rotary scattering process. Optical rotary dispersion is a variation of rotary power with wavelength and measuring rotary dispersion is rare only for asymmetric compounds. To study the basic parts of dispersion curves, it is necessary to measure the optical rotation of the material via 92. The absorption zone of this material.
Experimentally, this is only possible if this absorption belt is in the accessible part of the spectrum. So far, the Carbonico Group (Amax at 280-300 MP) is the only suitable absorption group that meets the necessary requirements. Therefore, it is currently measured in the range of 700-270 MP. There are three types of rotating dispersion curves: a) simple curves; (6) effect curves with one cotton; (C) Curves more cotton. Weidentify A) and (6); (c) Two or more filaments are suitable and valley number 93.
Simple curves. They do not show a maximum or minimum ie. H. they are smooth curves and can be positive or negative depending on the rotation, becoming positive or negative as the wavelength changes to shorter values (Fig. 1A). Individual cotton impact curves. Also called abnormal curves, they show a high and a low, both at $94.
300 NY <700 MFT (A) 300 M/<(*) 700 M // 95. 1.1. image. Maximum absorption (Fig. 1. 6).
Curves are defined as positive or negative depending on whether the crest or valley appears at the longest wavelength. Thus, the curve shown in Figure 1. (&) is positive. As mentioned above, the molecule must contain a carbonyl group in order to obtain individual cotton performance curves (see also Section 8 iii). The wavelength of maximum UV absorption is called the "optically active absorption volume", and since rotational dispersion measurements are only for compounds of asymmetric value, compounds must be used to obtain correct curves containing the asymmetric carbonyl group. environment. Enantiomorphs have curves that are mirror images of each other; Joints near the enantiomorphic carbonyl group have a dispersion curve with approximate mirror images; And linkers with the same relative configurations near the carbonyl group have the same indication of the distribution curves. There are many ways to introduce rotational variance: (i) quantitative analysis measures; (ii) identification of the carbonyl group; (iii) the position of the carbonyl groups; (iv) determination of relative configurations; (v) create absolute configurations; Vi) Determination of conformation. Some examples of these programs are described in the text (see Arrow). §13. Dipole moments. If the electron and nuclear stacks of a molecule do not collapse, the molecule has a constant dipole moment of 98. The value is the electronic charge E and the distance d is the distance d. Between charges (positive and negative center). Since E 10-10 E.SU. and D 10 ~ 8 cm.
Therefore, P is 10 ~ 18 E.SU. This unit is known as Debye (D) Debye, which works hard on dipole moments. Dipole moment is the magnitude of a vector and its direction in a molecule.Often shown through an arrow that runs parallel to the line that connects the 99 load points and shows the negative end, e.g. B. HCI (Sidgwick, 1930). The greater the value of the dipole, the greater the polarity of the connection. It should be noted that the terms are used to describe polar and non -polar compounds, molecules and groups. The bond diopoli derive from the forces of different atoms (or groups) of electrons attached to this link. This unequal electronegativity, which creates a moment of dipole, seems to be a satisfactory explanation for many simple molecules, but is unsatisfactory in other cases. Therefore, a number of 100 factors must intervene to determine the value of the value of the dipole. It is now assumed that four factors contribute to the moment of bond: (i) The unequal sharing of the bond electrons, due to the different electronagativity of the two atoms, creates a moment of dipole. (ii) In the event of covalent bonds, the dipole occurs due to the difference in size between the two atoms. Fire (loads) is essentially every atom that contributes. With atoms of different sizes, the resulting 101 is not in the middle of the bond, hence the moment of bond. (iii) orbital hybridization creates asymmetrical atomic orbitals; Therefore, the focus of hybridized orbits is no longer at the level of the parents. Only when the orbitals are pure s, p or D there are the nuclei.
Therefore, hybrid orbitals create a moment of bond. (IV) the pairs of lonely electrons (for example, on an oxygen atom in water) do not contain "pure" electrons; They are "dirty" due to hybridization with the electrons P 102. If the electrons of the isolated couples were not hybridized, their attention was focused on their nucleus; However, the hybridization changes the focus of the nucleus, therefore the asymmetrical orbital product causes a moment of bond that can be so large as to dominate the contribution of other factors at the moment of dipole. The following points are useful in organic chemistry: (i) In the Hâz bond where Z is an atom different from hydrogen or carbon, 103. If the hydrogen atom is the positive end of the dipole, i.
H. Haz. (ii) In a câz bond where Z is an atom like carbon, the carbon atom is the positive end of the dipole, that is H. Caz (Coulson, 1942). (iii) If a molecule contains two or more polar bonds, the resulting moment of dipole of the molecule is preservedAddition of a vector vector of the constitutional relationship dipole. Thus, the symmetrical molecule is

non -polar but may have polar bonds, such as CC1 dipole moment is zero, despite 4104. Because the dipole moments are vector dimensions, the sum of two vectors or, if parallel, ; The moment of the group along the joint consisting of the "primary" atom and the carbon atom to which it is connected is the axle, is the linear moment of that group. Such groups include H, halogen, me, cn, no 2 and others.

On the other hand, groups with nonlinear moments can be OR or C0 2H, NH A and others. This is a linear or non -linear problem. Moments of the group are 105. It is very important when using bottom gold, for example, to find out the configurations of geometric isomers (see §5.iv), orientations in benzene (see Vol. I).

If any molecule (polar or non -polar) enters the electric field, the electrons move from the normal position (in the direction of the external field in the direction of the pole). Positive nuclei are also shifted (in the direction of the external field in the direction of the negative pole), but their displacement is much lower than that of electron due to a relatively high mass. These changes cause induced dipole 106, which exists only in the case of an external electric field. The value of the induced dipole depends on the strength of the external field and the polarization of the molecule, ie how easily the outer field moves the invited centers. If P is a total dipole moment, P^ is a constant dipole moment, and p a is induced dipole moment, p = pâ + Pa decreases with increasing temperature but independent of temperature. The value of P is 107 solution. The dipole -given solvent type and concentration measurements were available to obtain a wealth of information about molecules, such as (i) was found in molecules configuration, such as a water dipole moment A s and therefore the molecule cannot be linear, flat ammonia and phosphorus trichloride molecules (II) And the fact that 108 was not redirected. The derivatives were tested with dipole moments (see Vol. I.) At the same time, this method showed that the benzolo molecule is a flat (III) dipole momentwere used to distinguish geometric isomers (see § 5. IV). (iv) Dipole moments have been used to prove the existence of resonances and elucidate electronic structures. (v) Differences in energy between different conformations (see § 4A. II) were calculated from dipolar data 109. vi) The presence of dipolar moments leads to association, to the formation of molecular complexes, etc. §14. Magnetic susceptibility. When a material is exposed to a magnetic field, the material may or may not be magnetized. If I is the intensity of the induced magnetization and H is the intensity of the magnetic field that causes it, then the magnetic susceptibility k is obtained as follows: i k = h 110. Magnetic induction b - b = h + 4tti, since i = *H, b = h (l + 4n k) The quantity 1 -f- 4jik is called the magnetic permeability, /i. Elements other than iron, nickel, and cobalt (which are ferromagnetic) can be divided into two groups: (i) paramagnet: in this group, [I is greater than one, so K is positive. (ii) Diamagnetic: In this group, FI is lower than one and hence K is 111. Negative. All compounds are paramagnetic or diamagnetic. Non-magnetic materials have a constant magnetic moment and are therefore oriented towards an external magnetic field. Diamagnetic materials do not have a permanent magnetic moment and tend to orient themselves perpendicular to the external magnetic field. Because of the spin, the electrons have magnetic dipoles. When the electrons are connected (that is, their spins are anti-parallel), the magnetic field 112. is cancelled. Most organic compounds are diamagnetic because their electrons are not paved. However, "odd electron molecules" are paramagnetic (see also §19). & Magnetic susceptibility was used to obtain information about the nature of the links and the configuration of the coordination compounds. Non-magnetic organic compounds are generally free radicals (odd electron molecules) and, for example, the degree of dissociation of hexaphenylethane and triphenylmethyl was measured using its 113. Magnetic Independence. §15.

Absorption spectra. When a molecule absorbs light (a term applied to electromagnetic waves; any wavelength), the molecule comes out of a less energy state than a higher energy state. If the molecule is monoatomic, the absorbed energy can only be used to raise the energy level of the electrons. However, ifAbsorbed light, consisting of more than one atom, can cause changes in electronic, rotational or vibration energy. Electronic transitions provide absorption (or 114 emissions) in the visible and ultraviolet spectrum, while rotation and vibration transitions provide proper absorption (or emission) in the distant and near infrared light. The other two can accompany electronic transitions. The study of these energy changes includes information on the structure of the molecules. Spectral wavelength (a) ultraviolet. . .

2000-4000 visible .... 4000-7500 close infra-ed. . . 7500-15 x 10 4 115.

Tall infrared radiation. . . 15 x 10 4 -100 x 10 4 The position of the absorption band can be indicated as a wavelength A (cm, /e, a, m /j.) Or as a wave number V (cm. -1).

1 fi (micron) = 3 mm. 1 m/i (millimicrone) = 10 ~ 6 mm. 1 inch (angstroms) = 10 ~ 8 cm. = 10 mm. 1 m f i = 10 A. 10* V (cm.

-1) = v (cm.1) 116. 1 10 4 10 8 A (cm.) A (/i) a (A) If E 0 is monochromatic light, Falling beam and outgoing beam passing through the environment with absorption thickness I, and then t i = I 0 10- "O log 10 = el, where e is the average extinction factor. Protection I 0 /E is called the average permeability and reciprocity congress. Functions 10 and 0 /E are called density (D) 117. If the absorbent substance is in solution (solvent is colorless) and if C has concentration (grams per liter) then I = I 0 I-RF This equation is the Bureau Law (1852), and most solutions to this match if they are diluted. More concentrated solutions contain more concentrated solutions. Beer law that can be caused by the association changes Solvat and is characteristic of pure association (in identical conditions).

§15a. Spectra.When the molecule absorbs light, it will be lifted from the base to the proposed position. The position of the absorption band depends on the energy level of the sta the rpers between the substrate and the proposed states. Any changes in the molecular structure that change the difference in energy between the basic positions and the proposed states will affect the position of the absorption band. This lane shift (UV and visible regions) is a problem(See vol., xxxi ch.). With several exceptions, only molecules with many compounds cause near-ultraviolet absorption. The intensity of the maximum intensity of the absorption of compounds containing one bonding group can be very low, but if the conjugation is several of these groups, the absorption, for example, is isolated oxylium (carbonym) 120. Amax absorption. 2750 acres; Excellent ethylene - maintenance has absorption ^ max. In 1950, A. If the compound contains an ox group combined with a compound with ethylene, that is, Y. The compound is an OXO unsaturated ox, the two tracks are no longer in their original positions, but are translated to 3100-3300 A and 2200-2600.

Methods) It can also be said that it studies the ultraviolet absorption spectrum, 121. The two groups are combined or not. (See, for example, Kholustenon, Article 3 II). Xi).

Ultraviolet and visible absorption spectra have also been used to distinguish geometric isomies and to determine the presence or absence of restricted rotation (2c) diamphinyl compounds. §15b. Infrared spectra. In a molecule containing a certain configuration, the vibration of the components vibrates with frequencies that depend on the mass of atoms and feeding forces that appeared when the 122. Molecule is distorted from the equilibrium configuration. The energy of this vibration is absorbed by the drop, leading to a spectrum of vibrations. While the joint has a characteristic absorption band, the frequency depends to some extent on the nature of the other atoms associated with the two atoms under consideration. Thus, we can discover that there are no well-known components (hence groups) in nature by comparing their infrared spectra with infrared spectral absorption tables. At the same time there are also 123. Initial structures (derived from chemical data) can be checked against a range of structurally similar compounds.

Infrared spectral tests produce information on many types of problems, such as (I) infrared spectroscopy has been used to distinguish the gauge from isomers, and recently Kuhn (1950) has shown that stereoisomers.

Methyl-a- and ^-glycosides are different. This also appears for enantiomorphs 124. solid phaseThey have multiple absorption spectra. Infrared spectroscopy has also been a very valuable tool in conformational research (see §11.IV). (ii) Three unbounded isomers have characteristic absorption bands that provide a means of determining their orientation.

(Hello) Infrared spectroscopy provided a lot of information on the problem of free turnover around a simple compound. P. (iv) Tautomère mixtures and the amount of toutomeri obtained were examined. In many cases, the presence of tautomerism can be verified using infrared spectroscopy (see III). (V) It seems that infrared spectroscopy is the best way to verify the presence of hydrogen bonds 126 (both in combination and in chelide). In "ordinary" experiences, the enduline hydrogen bonds cannot be distinguished. However, these two collage modes can be differentiated by obtaining a range of ghosts for different dilutions. As the dilution increases, the absorption due to intermolecular hydrogen bonding decreases, while the absorption of intramolecular hydrogen bonding has no effect. (Vi) It is possible to assess dipolar moments based on infrared spectra.

127. (vii) When the bond between two atoms is lengthened, the withdrawal force works immediately.

When the distortion is low, it can be assumed that the withdrawal force is directly proportional to the distortion, i.e. H.

F oc d or f ≤ m, where k is a constant strength of the connection.

It is possible to calculate the value of these permanent forces from infrared (vibration) spectra. (Viii) The surface of far infrared or microwave contains a clean curve spectrum. Microwave spectroscopy (the most recent development) offers a very good method of 128 for measuring bond lengths. It is possible to calculate the atomic beams based on the length of the bonds, but the value depends on whether the bond is single, double or triple, as well as on the charges (if any) atoms. Therefore, the type of bond can be determined based on its length, e.g. Resonance can be caused.

Some covalent atoms(Angstrem): 129. H 0-30 C (one) 0-77 C (double) 0-67 C (triple) 0-60 microwave oven is particularly useful to learn about the molecular structure of fleece gases and is used. Also, to show the presence of free radicals.

§15c. Spentry Ramana. When a monochrome beam passes through a transparent tool, most lights or 130. The prevalence of wavelengths is transmitted. However, some of the light can be converted into longer wavelengths, ie at lower frequencies (less light in shorter wavelengths, ie higher frequencies). The highest frequency changes are known as Raman Movement. It is not dependent on the light frequency used, but it is characterized by the connection. Mutters Raman, for example, indicates that the formaldehyde spectrum in the aqueous solution does not contain oxo groups and therefore concludes that the formaldehyde is moistened: CH2 (OH) 2.

Spectari Raman is hydrated. Geometric isomerial discrimination to provide resonance tests, to show the existence of the relationship and to provide information about the strength properties of the connection. §16. X -Ray analysis. Fiber. When the X-rays (wavelength of 0-7-1-5 A) fall into solids, it is expanded to form the base (occurs in the film). X -Rays will be a function of crushing atoms, as atomic orbit electrons are distributed mainly. Therefore, it is difficult to distinguish atoms with very close atoms such as carbon and nitrogen. In addition, since the strength of the hydrogen atoms (X -RAYS) is very low, these atoms cannot be defined except for very favorable conditions and therefore, except for only relatively simple compounds. The X-Lay break model interpretation includes two problems, ie the size of the unit cell, and the location of individual atoms in the molecule. The position of the scattered rays depends on the size of the unit cell. The knowledge of these dimensions allows the use of the following applications:(i) STIES identification; This is done by searching for unit cell tables. (ii) Molecular weight detection. If V is the volume of unit cells, D-Tank, and N molecules in individual cells, then the molecular weight is M, calling M = Â(III) molecules. Many long chains 135.

Polymers are like fibers such as cellulose, keratin. This fiber consists of small crystalline fibers whose axis is parallel or nearly parallel to the axis of the fiber. When X-wash falls into the fiber in a direction perpendicular to its length, the resulting pattern is similar to a crystal rotated around its major axis. In this way, the size of these fiber units can be obtained (see, for example, rubber, §33 VIII). The diffraction intensity depends on the position of the nuclei in the unit cells. Knowledge of the following 136. Intensities defines the following applications: (i) Ligaments, determination of valence angles and the general distribution of electrons in molecules. (ii) Determining the symmetry of molecules. It offers a means to distinguish geometric isomers and also explains the shape of the molecule, for example, the diphenyl molecule has a center of symmetry, so the two benzene rings must be collective RAN (see §2 V). (iii) Structure definition. 137. This program was initially used to connect some structures. Study models based on the structure of the molecule were compared with x-lay models and in case of 'settling', the already assumed structure was validated. If the models did not agree, a different structural formula had to be found. But recently. X-ray analysis such as penicillin (6a § xviii) is suitable for unknown or partially known structures. (iv) X-ray analysis is used to determine the 138th conformation. Rotational isomers (§4a. II), as well as the establishment of the absolute enantiomorphic configuration (§5 II). §17. Electron diffraction. Electron diffraction is another direct method for determining the spatial arrangement of atoms in a molecule, and is generally constrained by gas or compounds under vapor conditions, but can be applied to solids and liquids. Electrons have dual behavior, particles or waves, depending on the nature of the experiment. The wavelength of the electron is reversed in proportion to its momentum: 139 The wave is about 0-06Commonly used voltages.

The slight diffraction of hydrogen atoms makes detection difficult.

Using electronic diffraction, the lengthwise size and shape of the plug, as well as molecules, especially macromolecules, can be preserved. Electron diffraction studies have been particularly useful for CYC/ohexane compounds (see § 11 IV). §18. neutron crystallography. Slow neutrons radii 140 radiate crystal transparent materials. The radius equivalent wavelength of the sex neutrons is 1 A, and since this is the order of all crystals, the neutrons are distributed. This method of analysis is particularly useful for determining the position of light atoms, a very difficult and often impossible problem in X-position analysis. Neutron diffraction is therefore particularly useful in detecting hydrogen atoms. In addition to the study of solid materials, neutron diffraction was also applied to gases, 141. pure liquids and solutions. §19. electron resonance. Electrons have spin (and thus a magnetic moment), so they can interact with an external magnetic field. The covalent spin pair of an electron and its element obtained by a magnetic field is canceled in the same way and in opposite rotation to its partner (see also Article 14). However, without a bonded electron the interaction is not canceled and their interaction energy can change if their spin changes in the opposite direction (electron 142. It has quantum back; it can have +J and â values.) that an electron not associated with its spin sign in a magnetic magnet in a field of maximum energy, energy must be absorbed and this must be done by providing electromagnetic energy of a suitable wavelength. By choosing the right resistance to the magnetic field, it is possible to absorb an unbound electron to absorb the microwave range. A field of about 3000 gauss is usually combined with radiation of a frequency of 9 kmc ./sec. This method of producing the spectrum is known as Electron 143.

Resonance Rotation (ESR) or Electronic Paramagnetic Resonance (EPR). ESR is used as a method of studying free radicals. It provides measures to detect and measure the concentration of free radicals and specific information about their structure. The ESR program has shown that free radicals are involved§19a.

Nuclear magnetic resonance. When the electrons turn, the atom of protons and neutrons in the nuclei also rotate. Most spins of the nuclei do not rise, so these nuclear magnetic moments have a nuclear magnetic moment. When the core has a magnetic moment, the main state consists of two or more energy levels that do not differ from each other. However, the transition from one level to another can be caused by quantum absorption or radiation of the corresponding frequency radiation, determined by the difference in energy between the two nuclear markets. This frequency occurs in the area of radio frequency and can be changed by changing the strength of the field. Thus, the spectrum is obtained by the method of nuclear magnetic resonance (KMR). For most magnetic hearts, resonant frequencies are from 0 to 1 to 40 μA. Fields from 1000 to 10,000 sluggish. The properties of the proton nucleus are especially important; We have a special case of a JAMR here, the magnetic resonance of the proton. Most of the work in this area is performed with protons; Protons give the most powerful signals.

The analysis of the KMR structure is largely based on the fact that, despite the study of the same core, the KMR spectrum depends on the environment of this nucleus. This difference in resonance frequency is called chemical displacement; Chemical shifts are low. Thus, CAH can be identified in saturated hydrocarbons and olefins; A methyl group attached to a rich carbon atom can be separated from a group added to unsaturated; etc. KMR is used to obtain information about the molecular structure, identify molecules and study the crystalline structure of solids. It is also used to measure the keto-turning balance and determine the association, etc. 147. KMR is also useful for the analysis of conformation (4a. II) and various cisse and transimmvc for distinguishing (§). 5.iv). Read Partington links, an advanced treatise on physical chemistry, Longman, Green. So to speak.

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Roberts, spenetic nuclear resonance spectroscopy, /. Chemistry. Education, 1961, 37, 581 Darrant and Darrant, introduction to the advanced inorganic chemistry, Longman Green (1962). Part 1-12 (quantum theory, value, spectra, etc.). Chapter II optical Isomeria 156. §1. Stereoisomerie. The stereochemistry is "cosmic chemistry", i. H. stereochemistry deals with the spatial distribution of atoms and groups in the molecule. Stereoisers consist of isomers with the same structure, but differ in the spatial area, i. H. with different configurations. Different configurations are possible because carbon mainly creates covalent and has a spatial direction.

The Kowalene binding is generated by blocking atomic paths, and communication energy is greater than the overlap of 157th components. In order to achieve a maximum overlapping orbit, orbitals must be on the same level. For this reason, non -pharmaceutical orbital tends to establish connections to a higher orbital concentration, and this creates a direct relationship (see also Volume I, Chapter II). There are two types of stereoisomeries: optical isomerie and geometric isomerie. It is not easy to define them, but their importance becomes clear when the stereochemistry progresses. 158. At this stage, however, it is very advisable to have an idea of their importance, which is why the following biographies are given. Optical isomeria is characterized by connections that have the same structure, but a different configuration, and due to the molecular asymmetry, these compounds twist the polarization of the flat light. Optical isomers have similar physical and chemical properties; The most striking difference between them is that they are polarized on light on the level (see § 12 I). Optical isomers can turn the polarization level equally and 159. Opposite values; These optical isomers are enantiomorphic (see § |). On the other hand, some optical isomers can turn the polarization level with different dimensions. These are diasterezomers (see §7b). After all, some optical isomers may have no rotation at all; These are a mesotype diasterezomer (see §7d). Geometric isomeria is characterized by connections with the sameBut due to their different configuration and molecular symmetry, these compounds do not cut the plane of polarization of polarized light in the 160 plane. Geometric isomers differ in all their physical properties and many chemical properties. In addition to increasing geometric isomerism, they can also exhibit optical isomerism if the molecular structure is also asymmetric. In principle, geometric isomerism involves molecules that can assume different stable configurations; this may be due, for example, to a double bond, a cyclic structure, or a steric effect (see Chapters IV and V). §2. Optical isomerism. Only crystalline or molecular structures whose mirror images are not superimposed were found to be optically active. Such structures can be asymmetric or asymmetric. Asymmetric structures have no element of symmetry, but asymmetric structures can exist in two forms (mirror images of each other) that, while having some element of symmetry, somehow do not. To avoid unnecessary complications, we will use the term asymmetric to cover two situations (asymmetry and asymmetry). Given molecule 162 with at least one symmetry element (§6). A "classical" configuration (ie, the Fisher projection formula; §5) can still be a conformation (§4A) that does not contain any symmetry elements. . At first glance, such a molecule may be optically active. But in practice this is not the case; Individual molecules are optically active, but statistically not all molecules are. Thus, if a molecule can exist in one or more structures, provided that at least one of them (preferred or not) is 163. The mirror-image blocking compound will not be optically active (see § 11 discussion). from this problem) Optical activity due to crystal structure. Quartz, Sodium Chlorate, Benzyl, etc. There are many substances that are optically active only in the solid state. Consider quartz, the first substance to be shown to be optically active (Arago, 1811). Quartz exists in two crystal forms: one for dextrogy and the other for levogy. These two articles are mirror images and cannot be posted. Such pairs of crystals are said to be enantiomorphic (quartz crystals are actuallyand mirror images). X-ray analysis showed that the quartz crystal cage was made of silicon and oxygen atoms arranged in sinister, straight spirals. There is no mirror and adjustment. The optical activity disappears when the quartz crystals are combined. Therefore, since fusion brings only physical changes, the optical activity is completely due to the asymmetry of the crystal structure. Therefore, we have a group of 165 substances.

Optically active as long as they remain solid; Melting, evaporation or solution in a solvent causes a loss of optical activity.

Optical activity due to molecular structure. There are many solid, fusion, gas or dissolved compounds, such as glucose, tartaric acid, etc. In this case, the optical activity is entirely due to the asymmetry of the molecular structure (but see -n -in -e -n -n -n -n -n -an -n -n -n -n -n- -n -n -§11). The original molecule and its rough mirror image are known as the enantomorph (this name is taken from 166.

crystalgraphy) or optical antipodes. They are often indicated as optical isomers, but this term tends to separate the same structural formula but all isomers with different configurations (see §§1). Property of enantiomorphs. Enantiomorphs appear physically identical except for two relationships: (i) polarized light forms; The curves are the same but opposite. 167. (ii) The absorption coefficients for right and left circular polarized light are different; This difference is known as circular dicroism or the cotton effect (see also §8.iii). Crystalline forms of enantiomorphs can be mirror images of each other, i.e. the crystals themselves can be enantiomorphs, but this is not common [cf. See also. §10(i)]. Enantiomorphs are chemically similar, but other optically active compounds and reaction rates are often different [see. §10 (vii)]. They can also be physiologically different, for example, (-f-)-histidine is soft, ()-inine; 168. (Â)-nikotin is more pronounced than (+)-'. §3. Tetrahedral carbon atom. In 1874, Van't Hoff and Size suggested Van't Hoff's theory, independently of the fact that they provided a solution to the problem of optical isomerism in organic compounds. regularly) All cases of isomerism known by a carbon atom in the center are considered. To go to bedThe theory is essentially the same as with Van't Hoff, however, differs in the fact that Van-Hoff sees the distribution of valence than 169. The distribution is strictly tetrahedral and firm, Le Llabled believed that the valence aspects are not strong. It was firm and had no tetrahedron system. Organic chemistry [Chap.

II, but I thought that the CDBDE molecule would be asymmetrical regardless of the spatial position. Later studies showed that Van't Hoff's theory was more objectively correct (see below). Both the theory of Van't Hoff and LE BEL's theory go back to 170 AD.

Assumption that the four hydrogen atoms in methane are equivalent; This assumption was demonstrated by chemical and physical-chemical methods. Before the tetrahedron was suggested, the four carbon plates were flat, with the carbon atom in the middle of the square (KEKULE, 1858). Pasteur (1848) said that all substances in relation to their mirror images and those who do not do this fall into two groups. In substances such as quartz, the optical activity depends on the dissymmetry of the crystal 171. The structure, but the optical activity in compounds such as sucrose is due to molecular immymthetry. Since it is impossible to have molecular asymmetry when the molecule is planar, Pastera's work is based on the idea that molecules are three -dimensional and have an orderly resolution. Another interesting point is that Pasteur called it an irregular tetrahedron, an example of an asymmetrical structure. In addition, Patemo (1869) proposed tetraedric models of the structure of isomerer compounds (at that time assumed 172.

§3 A. Evidence of the existence of a carbon atom tetrahedron. The CX 4 molecule is a five-point system, and since the four carbon atoms value equal If you can assume that your positions in the room are symmetrical. There are three symmetrical positions, a planar and two pyramid -shaped constants and a tetrahedron for the Molecule CX 4. The number is predicted in the three spatial arrangements as correctly become.

Combinations of the species approx. 2 6 2 and approx.^Vol. Both are similar, and therefore we will only discuss the molecule cro "2 6 2.Then 174. There are two forms (Fig. 1). This flat configuration can be square or rectangular; In any case, there are only two forms. Figure 2.2 (II) If Piiramula is a piramula, two forms are possible (Fig.

2). There are only two forms, regardless of whether it is a square or rectangular base. 175. (III) If the molecule is a tetrahedron, this is only possible in one form (Fig. 3; the carbon atom is in the middle of the quadrah). Â §3a] Optical isomeric 23 In practice, only one form for each type of CFL 2 6 g and ca 2; This corresponds to the tetrahedron configuration. 176.

Figure 2.3. Cabie relationships. Possible forms (Fig. 4).

(I) If the molecule is flat, three and*- T'a Figure 2.4. ! R * 177. (ii) If Piiramula is a pirila, six forms are possible; There are three pairs of enantiomorfs. Each of Fig. 4. Displayed mold, drawn as a pyramid, cannot be placed in a mirror image, for example, Figure 5. shown in one parish enantiomorphs. Ei ~ 178. and 2.5. (Iii) If the molecule is a tetrahedron, two forms are possible, they are connected as an object and a mirror image that does not match, i.e. tetrahedron configuration causes one pair of enantiomorphic (Fig. 6). Y 2.6. 179. In practice, only one pair of enantiomorphic causes CABDE relationships; This corresponds to the tetrahedron configuration. If there are four different groups related to the carbon atom, this carbon atom is asymmetrical (in fact, this is of course an asymmetrical group; a carbon atom cannot be asymmetrical). Most optically active (organic) compounds contain one or more asymmetrical coal atoms. It should be noted, however, that the main requirement of optical activity is 180. Asymmetry of the molecule. The molecule may contain two or more asymmetrical coal atoms and is still not optically active (see, for example, §7D). The most interesting case of optically active compounds containing one asymmetrical carbon atom is the use of S-bulgivsivsidrio etmech'HGBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBans are the one. It seems that this is the first example of a simple organomethaum of a relationship in which asymmetry depends only on the carbon atom attached to the metal. Isotope asymmetry.

In the optically active connection, the Cabe A, B, D and E group (which may contain or not contain coal), but for example two or more can be structural isomers.It is optically active. In recent years, hydrogen substitution has also been studied to see if the two atoms are sufficiently different to produce an optical isomer. Previous work has produced conflicting results, such as Clemo et al. (1936) found that they have little rotation in A-182.

pentadadeuterophenylbenzylamine, C6d5*CH(C6H5)'NH2, but this was disproved by Adams and Kol. (1938). Erlenmeyer et al. (1936) failed to resolve C6H5-CH(C6D5)-CO2H and Ives et al. (1948) also failed to resolve a series of Deutero-Powers, one of which was C6H5-CHD-C02H. Recent work, however, is definitely irreversibly in favor of optical activity, for example, Eliel (1949) prepared the optically active phenylmethyldeuteromethane, CH3*CHD-C6H5, 183. Reduction of the optically active phenylmethyl chloride CHG-CHCL-CGHG with lithium albumin with deuteride; Ross et al. (1956) obtained (α)-2-deuterobutane by reduction of (α)-2-chlorobutane with lithium-aluminum deuteride; and Alexander et al. (1949) reduced trans-2-P-Hentsen with deuterium (Raney nickel catalyst) and obtained 2:3-dideutero-tfra "s-^>-menthane (i), which was slightly left. Alexander (1950) also reduced (α)-menthyltoluene-/>-sulfonate and obtained the optically active 3-184. Deutero-^a s-j^-menthane (II). CH3.0H8CH3CH3CH. -Chdoh CH 3 -chdoh III IV Interesting precursors. Exceptions are (v) and (vi) which were solved by Poker (1961). 186. Ca 2 BD defines 187. Formation of only one compound (and decrease in optical activity), e.g. These results are possible only with four so-called C0 2 H OH 188. CH-, D-mmly acid HO propionic acid Fig.

2.7 CH 3 L-ACID (u) milk if anyThis is 189. Tetrahedron, then the list of two groups in the Cabe molecule is created by Enantiomorf, for example, B and E (see Fig. 8). Fischer and Brauns (1914), based (+) - Conh 2 and Harcg (CH3) 2C02H (+) - acid 190. Fig. 2.8 Conh 2 £ MVH-C-C-C-CH (CH 3) 2 S ^ C0 2 CH 3 C0 2 H Ha C â (CH 3)! J C0 2 CH 3 C0 2 H C0 2 H Conhnh 2 Conh 2 (-) - Kyselina 191. Acid caused a number of reactions in which carboxyl and coal groups were confused; The product was acidic (-) - questionnaires. It is very important to note that in this series of reaction no connection associated with the asymmetric atom of coal was never interrupted (see Inversion Walden, Chapter III). F i U T X is X Cl I I J GE, FR?

M One Eanton Imorf is consistent with the four theory. At the same time, this series of reaction shows that optical isomers have identical structures, so the difference should be caused by 192. The spatial system. (III) Crystallography X -Card, measurements of dipolar torque, absorption spectra and diffraction of electrons show that four coal valenations are located in coal atom with four pins, which in four hundred is not regular if they are not regular, regularly, like this Four identical. Groups are attached to the central carbon atom; Only in this organic chemistry 193. [Ch. In case of II, four communication lengths are the same. In all other cases, the length of the links will differ, the real values depend on the nature of the atoms attached to the coal atom (see § 15b. I). § 4.

The basis of four -sided theory is two postulates. (I) The principle of stability of the angle of valency. The mathematical calculations of the angle captured by each page of four hundred regular in the atom of medium coal (Fig. 9), with a composition of 109 ° 194, 28 '. Initially, it was assumed that the angle of valency was set for this value. However, it is known that the angle of Valencia may differ from this value. Four carbon valency consists of hybridization of 2 orbit and 2P2, that is, there are four links SP3 (see Volume I, Chapter II). Quantum mechanical calculations show that four coal valency in the CA4 molecule are equivalent and indicate four hundred regular turns. In addition, quantum calculations require coal bonds near 195. The value of tetrahedron, since the variability of this value is associated with lossStrength and, thus, reduces stability. According to Coulson et al. (1949) I calculated that the smallest expected angle of valency is 104 °. This value found in CYC/Opropan and CYC/Obuutane circles, and these molecules were relatively unstable from "curved" binding (see Baeyer Emprocess theory, Tomino I, Chapter XIX). (II) The principle of free rotation around the binding. Initially, it was assumed that the internal rotation was 196. As long as the custody was completely free. When the thermodynamic properties of ethane were calculated for the first time, provided that there was a complete free rotation around one carbon carbon binding, the results obtained were in poor consent with the results experimentally obtained. Pitzer et al. (1936), assuming that there is H H C C C B B B B B B 0 ° 60 ° 120 ° 180 ° 240 ° 300 ° 360 ° 197. The rotation angle (A) was forced to rotate around a simple connection and calculations based on this experiment. The potential energy curve obtained for Itan, which represents that one methyl group revolves around the binding of C#C in the form of the axis, while the other group is at rest, is shown in Fig. 10a). With complete free rotation, the graph will be a horizontal line. Dig the ground. 10 (b) is the projection of Newman (1952) 198.

Formula, carbon atom closer to the eye of §4] Opticai, isomer 27 was marked with equally distant radii and a carbon atom further from the eyes with a circle with three equally distributed radial attachments. Dig the ground. 10 (b) is a trans or circular mold in which hydrogen (on two carbon atoms) as far as possible. Dig the ground. 10 (c) is the form of cis or 199. The calculated form with hydrogen is as close as possible. The schedule shows that the shape of the coating has a higher potential energy than the coating shape, and the real difference was (in accordance with the calculations) about 2-85 kg. h h h h h h h h h h h h h h h h h h teght 201. Cisoidal) Sun Eclipse Pic. 2.11 (I). This potential energy barrier is too low to chemically isolate any form. Now we consider the case of ethylene chloride. According to Bern-Sam (1949), potential 202. Energy ethylenelorideThe one illustrated in Fig. 2.11(i) when one CH2C1 group rotates around a C#C bond while the other CH2C1 is at rest.

There are two minimum energy positions corresponding to the unfolded (transidal) shape and the second to the left (oblique) shape, the latter having a capacity of about 1-1 kg. More than the first. The fully eclipsed form (cisoid) has about 4-5 kg more energy than the unfolded form and thus the latter is the preferred form, i.e. the molecule is mostly in this form.

203. Dipole moment studies show that this is the case in practice, and also show (as do Raman spectra studies) that the ratio of the two forms varies with temperature. Furthermore, organic chemistry [ch. II Infrared, Raman and electron diffraction spectra showed that the left form is also present. According to Mizushima et al. (1938) only the decomposed form is present at low temperatures. The problem of internal rotation 204. Concerning the central C â C bond in butane it is of interest because the values of the potential energies of the various forms have been used in the study of cyclic compounds (see Cyc/Oheksan, § § § 11 (iv). Several shapes are shown in Fig. 2.11(ii), and if the energy content of the rounded shape is zero, then the other shapes have energy content (Pitzer, 1951).From the above count you can see that in theory there is no 3-6kg. free cal. 2-9KG.in. 205.-V/ 0-8kg.cal.

0° 60° 120° 180° 240° 300° 360° angle of rotation Fig. 2.11(ii). Me tt ^^/me me^-^H H 2 H 2 '206. rotation about a bond. In practice, however, the potential barriers of the different shapes cannot differ by more than about 10 kg.cal./mol. For simple molecules, it is generally free rotation about a single bond is accepted.However, restricted rotation can occur if the molecule contains groups large enough to prevent 2 07 to be free. Rotation, for example in ortho-substituted biphenyls (see Chap. V). In some cases, resonance can limit rotation around a "single" bond. §4a.

conformational analysis. Molecules that can form isomers by rotation about single bonds are called flexible molecules, and the different shapes they take are called different conformations. The terms rotational isomers and constellations have also been used in the same sense of conformations. Various definitions have been given