# Alkanes chapter notes pdf

Hydrocarbons contain only C and H form of basic carbon skeletons of functional groups: only C-H and C-C of one communication (alcans) C'C dual bond (alkenes) C'C triple bonds (alkins) rings (cycloalkans, bicycloalkanes, Polycloalkans) aromatic rings (arenes) Alkane Methane Family CH4 Ethan CH3CH3 propane CH3CH2CH3 butane CH3CH2CH2CH3 alkaline CH3 (CH2)nCH3 CnH2n-2 (Homologous Series) Higher Alcanes pen C5H12 hexagonal C6H14 heptan C7H16 octane C8H18 nonane C9H20 Dean C10H22 note Greek prefixes Alkane Isomers straight chain of branched chain of cycle circuit atoms linked in a different order Butan et isobutan 3 penta ayomera Bhutan isomer n-butan isobutan Pentan Isomers n-pentan isopentan neopentan alkyl group n-saw alcohol isopropyl alcohol (constitutional isomers) Bottle Group n-butil sec-butil iso Grated grated-butyl Classification of C 1 atoms - primary - related to each other C 2 - secondary - linked to 2 other C's 3 - tertiary - linked to 3 other C 4 - quarterly - linked to 4 other Class C also refers to H atoms or functional groups , attached to C Carbon Identification Classes define the classes of each group C, H and functional group in the molecule below the nomenclature of IUPAC (substitutes)--(parental alkaline)-(family) Cl-CH2CH2-OH 2-chloro ethan ol IPAC Parent Rules - the longest continuous chain of carbon numbers from the end closest to the substitute (1-4 difference) assign each number to the parent's organize substintents in alphabetical order for multiple substints, use d-, tri-, tetra,etc., but they are not taken into account when alphabetizing individual names from numbers with hyphens, numbers from numbers with commas otherwise all written as one word IUPAC Examples of the name of three isomers pentans name four isomers C4H9 IUPAC Examples Cycle The nomenclature Writing skeletal structures omit C-H bonds suggest C makes 4 bonds omit C atoms to take over C at the end of each communication especially useful for cyclical structures to be able to return all the details of the practice with linear structures of methylcycloxexane Alkanes - physical properties and sources of reaction gal Alcan combustion (later) Heat comparison of combustion relative probability from isomers oxidation The xtenes's xtenes's alkenes are the alkines of oxygen functional groups: alcohol zgt; carbonyl (aldehyde/ketone) is a carboxic acid zgt; CO2's other reactions This site uses cookies. Alcans are saturated hydrocarbons. They are made up of elements of carbon and hydrogen, and all the connections between carbon atoms are the same bonds. They have a common formula, CnH2n-2. Because all alkanes are similar in structure and properties, they are called homologous series. The structure of the alcan, like all hydrocarbons, can be represented by a 3D model, with all atoms and connections, in 3 dimensions. Full structural formula with all atoms and connections Skeleton formula, with only connections between carbon atoms shown. Shortened structural formula, linear form, where all atoms are shown, but there are no connections. ... Alcans can be long straight chains of carbon atoms, linked to each other and hydrogen, but they can also come in different forms. Branching can occur, as well as the formation of cyclical structures. It's called isomerism. Branched alcans occur when a straight chain of Alkane form replaces one of its hydrogen atoms with the Alkyl group (alcan, which similarly lost hydrogen at the end of the carbon), forming a branch. Branching can occur in different ways and means that different possible structures can exist for a single molecular formula. Branched Alkanes can have a 'iso' prefix. ... Cyclic alcans have a common CnH2n formula and consist of carbon atoms connected to a circular structure. They are called cyclo prefix, such as cyclokhexan. ... Because alcans are saturated hydrocarbons, they do not readily react. However, they can be made to react under certain conditions, so give useful products or energy output. Alkanes will react with oxygen if they receive sufficient activation energy. This will lead to a high exothermic reaction, producing carbon dioxide and water, making Alkanes very useful as a fuel. When the Alkanes C4-C6 is heated to 150 degrees Celsius with a platinum aluminium oxide catalyst catalyst, isomerism occurs. The reaction produces a branched Alkanes, and is therefore useful in improving the octane number. Reformation is the process of increasing the number of cycloalcans and hydrocarbons containing benzene rings to improve the octane number. This is done with the Alcans in the Nafta faction (C6-C10) at 500 degrees Celsius with an aluminium oxide catalyst. Hydrogen is processed through the mixture to reduce coking. Cracking is the process of breaking the longer Chain of Alkanes down on smaller Alkanes and Alkenes, sometimes for the production of polymers and sometimes to improve the octane number. Cracking steak involves heating Alkanes from Naphtha and kerosene fractions (C6-C16) to 900 degrees Celsius without a catalyst and using steam as a smashing to reduce coking. This is used in the production of polymers. Catalytic cracking takes raw materials from longer chain alcans in a fraction of gas oil (C14-C20) and is heated to 500 degrees Celsius with zeolite. This can produce branched and cyclical hydrocarbons and is used to improve the octane number. Alcans are organic compounds that consist of single-family carbon and hydrogen atoms. The formula for Alkanes is CnH2n'2, divided into three groups - chains alkanes, cycloalcans, and branched alkanes. Alcans are made up of a number of compounds containing carbon and hydrogen atoms one with covalent connections. This group of compounds consists of carbon and hydrogen atoms with single covalent bonds. It also includes homologous series that have formula C nH2n-2. The simplest family of compounds is called alcans. They contain only carbon and hydrogen. Each carbon atom forms four bonds, and each hydrogen atom forms one bond. Chemists use linear formulas because they are easier and faster to draw than compressed structural formulas. Structural formulas for alcans can be written in another condensed form. The recommended video of hydrocarbons Simple alkaline methane contains one carbon atom and CH4 as its molecular formula. Since this compound has only single covalent bonds, so its structural formula is in a long chain alkaline molecule, additional carbon atoms attach to each other using a single covalent bond. Each atom is attached to sufficient hydrogen atoms to develop a total of four single-valent bonds. This long-gauge structure is known as the octane number. Eight-carbon alkaline has a molecular formula - C 8H 18 and structural formula - Alkanes List of some alcans and molecular formula is below. List of Alkanes Molecular Formula Methane Structure (CH4) Methan Ethan (C2H6) Ethan Propane (C3H8) Propane Bhutan (C4H10) Bhutan Pentan (C5H12) Pentane Hexane (C6H14) Hexan Heptan (C7H16) Heptan Octane (C8H18) Octane Nonan (C9H20) Nonan Dean (C10H22) Dean Of Physical Properties Alkanes 1. Solubility Alkanes Because of very few differences in electronegates between carbon and hydrogen and the covalent nature of the C-C or C-H communication, alcans are usually non-polar molecules. As we usually observe, polar molecules are soluble in polar solvents, while non-polar molecules are soluble in non-polar solvents. Thus, alcans are hydrophobic by nature, i.e. alcans are insoluble in water. However, they are soluble in organic solvents, as the energy needed to overcome the existing forces of Van Der Waals and create new forces of Van Der Waals is quite comparable. 2. The boiling point of Alkanes As the intermolecular forces of Van Der Waala increase with the increase in molecular size or surface area of the molecule we observe: the boiling point of alcans increases with the increase of molecular weight, straight chains of alcans are observed to have a higher boiling point compared to their structural isomers. 3. The melting point of Alkanes melting point of alcans follow the same trend as their boiling, that is, it increases with the increase in molecular weight. This is due to the fact that the higher alcans are solid bodies and it is difficult to overcome intermolecular forces of attraction between them. It is generally believed that even alcans have a higher tendency at melting point compared to odd alcans, as even alcans are good in a solid phase, forming a well-organized structure that is difficult to break. Also, Read in detail: Physical and Chemical Alkanes Alkanes The formula and structure of structural formulas for alcans can be written in a concise form. For example, the structural pentan formula contains three methylene CH2 groups in the middle of the chain. We can group them together and write a structural formula. The first five alkans of the unsalted chain formula are below. The name Molecular Formula Alkaline Condensed Structural Formula of Alkaline Methane CH4 CH4 ethane C2H4 CH3CH3 propane C3H8 CH3CH2CH3 Butane C4H10 CH3 (CH2)2CH3 pentan C5H12 CH3 (CH2)3CH3 A reduced way to make structural formulas in which each vertex and line of course represent an atom of carbon and each line. The Alkane Formula Chemistry Formula Organic Compounds formula presents information at several levels of complexity. Molecular formulas such as the octane number of each type of atom in a compound molecule. The C8H18 molecular formula can be applied to several alcans, each with unique chemical, physical and toxicological properties. These different compounds are marked by structural formulas showing the order in which atoms in a molecule are located. Compounds that have the same molecular but different structural formulas are called structural isomers. Most organic compounds can be derived from alcans. In addition, many important parts of organic molecules contain one or more alkaline groups, minus the hydrogen atom bound as substints to the main organic molecule. As a result of these factors, the names of many organic compounds are based on alcana. Branched Alkane Formula Chain Like other organic compounds, carbon atoms in alkanes can form straight chains, branched chains, or rings. These three species of alcans are straight chain alcans, branched chain alcans and cycloalcans. The common molecular lye formula for straight and branched chain alcans is CnH2n-2, and the cyclical alcana is CnH2n. In one molecule, all carbon atoms are in a straight chain, and in two - in branched chains, while in the fourth - 6 carbon atoms in the ring. Alkil Group When the summing up is like a halogen bond with an alkaline molecule, a single carbon-hydrogen bonding molecule gets converted into a carbon-substument bond. This can be understood by example - a new compound known as chloromethane is formed when methane reacts with chlorine. The new compound consists of the CH3 group, which is associated with the chlorine atom. When the lye, it has hydrogen, is removed from a single bond, it is called an alkyl group. This Alkyl group is often denoted by the letter the same as halogens representing the letter X. Here is a methane-chlorine reaction that can be summarized as methane (CH4), ethane (C2H6), (C3H8) and butane butane are the first four alcans. Methane gas, the molecular formula of which is CH4, is the simplest alkaline. Alcans are single-day atoms of hydrocarbons. There are three types of alcans available: linear straight alcans, branched alcans and cyclical alcans. As a rule, alcans are not considered functional groups; rather, alkaline is a compound that lacks functional groups. Carbon-carbon double bond is a functional group in the alken. In the homologous series, alkins are compounds with the general molecular formula Of CnH2n-2. Alkins are triple carbon-carbon hydrocarbons. They do not display any geometric or optical isomerism. Ethan (HC-CH), often known as acetylene, is the simplest alkin, as shown on the right. Learn more about hydrocarbons and their types by downloading BYJU'S - The Learning App. alkanes chapter notes pdf

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