

The Role of Alkanes in the Formation of Organized Structures

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DESCRIPTION

Alkanes are organic substances made of hydrogen and carbon atoms bound together only once. Alkanes have the formula C_nH_{2n+2} . Chain alkanes, cycloalkanes, and branched alkanes are the three classes into which they can be divided. Alkanes are the most fundamental family of chemical substances. They exclusively contain carbon and hydrogen [1]. Each hydrogen atom produces a stable bond, while each carbon atom produces four bonds. Since the line-angle formulas are quicker and simpler to draw than condensed structural formulas, chemists have been employing them. It is possible to write the structural formulas for alkanes in a condensed form. Hydrocarbons the chemical formula of simple alkane methane, CH_4 , is one carbon atom and four hydrogen atoms [2]. The term "hydrocarbon" refers to substances that only contain hydrogen and carbon atoms. Because this compound has a single covalent bond.

Alkanes' physical characteristics are divided into three categories. The first three properties are solubility, boiling point, and melting point. Alkanes are often non-polar types of molecules because of the tiny difference in electronegativity between carbon and hydrogen as well as the covalent nature of the C-C or C-H bond. As is typically observed, non-polar molecules are soluble in non-polar solvents while polar molecules appear to be soluble in polar solvents. In actuality, alkanes have a hydrophobic character, which makes them insoluble in water. Because the energy required to overcome the pre-existing van der Waals forces and to generate new van der Waals forces is relatively similar, alkanes are soluble in organic solvents [3-6]. The intermolecular van der Waals forces significantly rise when we raise the molecular mass or surface area of the molecule. Following are two observations on this process. The boiling point of the alkanes rises along with their molecular weight [7]. Comparing structural isomers to their comparable straight-chain alkanes, they have a lower boiling point. Alkanes, which are hydrocarbon compounds, exhibit melting point trends that are comparable to boiling point trends. And because higher alkanes exist in the solid form, it is more challenging to overcome the intermolecular forces of attraction. As a result, the melting point is greater and the intermolecular forces are stronger [8-10]. For

the same reasons as previously stated, the melting points of the alkanes exhibit a similar pattern to their boiling points. In other words, the melting point increases with molecule size (all other factors being equal). The difference between melting and boiling points is substantial. Compared to liquids, solids have a more fixed and hard structure. To disassemble this strong structure, energy is needed. The stronger solid constructions will therefore demand more energy to disassemble [11,12].

CONCLUSION

This is due to the fact that even-numbered alkanes solidify into well-organized structures that take more energy to disassemble. Odd-numbered alkanes don't pack as tightly, hence it takes less force to disassemble the looser-organized solid packing structure. See for a representation of crystal formations. The ability of the particular alkane in question to pack well in the solid phase will once again determine whether the melting points of branched-chain alkanes are greater or lower than those of the comparable straight-chain alkanes. Alkanes have the general formula C_nH_{2n+2} , where n is the number of carbon atoms in their chemical structure. As a result, there are $2n+2$ hydrogen atoms. All saturated hydrocarbons will adhere to this chemical formula.

Methane, sometimes known as CH_4 , is the most basic alkane. Here one atom of carbon is connected to four atoms of hydrogen *via* single bonds. Hence, the one valence electron on each hydrogen atom will form a link with the four valence electrons of carbon. Thus, a fully saturated hydrocarbon is created.

REFERENCES

1. Liu L, Zhang M, Wang L, Zhang X, Li G. Modulating acid site distribution in MTT channels for controllable hydroisomerization of long-chain n-alkanes. *Fuel Process Technol.* 2023;241:107605.
2. Dong Y, Zeng J, Dong X, Li C, Liu Y. The control effect of normal faults and caprocks on hydrocarbon accumulation: A case study from the Binhai fault nose of the Huanghua Depression, Bohai Bay Basin, China. *J Pet Sci. Eng.* 2022;218:110918.
3. Strozzi M, Smirnov VV, Pellicano F, Kovaleva M. Nonlocal anisotropic elastic shell model for vibrations of double-walled carbon

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Received: 02-Jan-2023, Manuscript No. OCCR-23-22296; **Editor assigned:** 04-Jan-2023, PreQC No. OCCR-23-22296 (PQ); **Reviewed:** 18-Jan-2023, QC No. OCCR-23-22296; **Revised:** 25-Jan-2023, Manuscript No. OCCR-23-22296 (R); **Published:** 01-Feb-2023, DOI: 10.35841/2161-0401.23.12.307

Citation: Bernd B (2023) The Role of Alkanes in the Formation of Organized Structures. *Organic Chem Curr Res.* 12: 307.

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- nanotubes under nonlinear van der Waals interaction forces. *Int J Non Linear Mech.* 2022;146:104172.
- Li J, Li K, Li H, Wang X, Wang W, Wang K, et al. Long-chain alkanes in the atmosphere: A review. *Int J Environ Sci.* 2022;114:37-52.
 - Lustosa AC, Evers M, Franceschini DF, Litterst FJ, Xing Y. sp-hybridized carbon atoms formed by low-energy collisions in carbon nanofoams produced by pulsed laser deposition. *Materials Lett.* 2022;314:131886.
 - Messerly RA, Knotts IV TA, Giles NF, Wilding WV. Developing an internally consistent set of theoretically based prediction models for the critical constants and normal boiling point of large n-alkanes. *Fluid Phase Equilibria.* 2017;449:104-116.
 - Ling Y, Zheng M, Sun Q, Zhang C, Wang Y, Xie M. Impact of climatic and environmental factors on δD of n-alkanes in the lake surface sediments of arid Tibet. *Quat Int.* 2022;637:44-56.
 - Failali A, Acher E, Guillaumont D, Vallet V, Réal F. Structural and thermodynamics properties of pure phase alkanes, monoamides and alkane/monoamide mixtures with an ab initio based force-field model. *J Mol Liq.* 2022;363:119797.
 - Moriue O, Eigenbrod C, Rath HJ, Sato J, Okai K, Tsue M, et al. Effects of dilution by aromatic hydrocarbons on staged ignition behavior of n-decane droplets. *Proceedings of the Combustion Institute.* 2000;28(1):969-975.
 - Yang W, Yang X, Wang Y, Hou R, Gong Q, Pan Y. Pervaporation separation of C6 alkane isomers by Al-btoto membrane. *J Membr Sci.* 2022;661:120916.
 - Xia X, Stewart DI, Cheng L, Liu Y, Wang Y, Ding A. Variation of bacterial community and alkane monooxygenase gene abundance in diesel n-alkane contaminated subsurface environment under seasonal water table fluctuation. *J Contam Hydrol.* 2022;248:104017.
 - Li J, Huang CY, Li CJ. Cross-dehydrogenative coupling of unactivated alkanes. *Trends Chem.* 2022;4:479-494.