Le butane et le 2- méthylpropane

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Open item An isomer of butane, a colourless, flammable gas. Keywords 2-methylpropane, saturated hydrocarbon, alkane, isomer, constitutional isomer, butane, chemistry Molar mass: 52.12 g/molMelting point: -159.9 °CBoiling point: -11.7 °CDensity: 0.00251 g/cm³Properties2-methylpropane or isobutane is one of the isomers of butane. It is a colourless, flammable gas, which dissolves well in alcohol and ether, but not in water.Occurrence and productionIt mostly occurs in gases formed during the cracking of mineral oil distillates. It can also be produced through the isomerisation of normal butane.Uses2-methylpropane is used in the production of alkylate petrol and isobutylene as well as in the manufacture of pharmaceutical and cosmetic products. Due to the ozone-diminishing effects of freons, this substance is gradually replacing them in aerosols and as coolants in refrigerators. Butane and 2-methylpropane, whose space-filling models are shown, are both nonpolar and have the same molecular formula, yet butane has the higher boiling point (-0.5 oC compared to -11.7 oC).Explain. In order to continue enjoying our site, we ask that you confirm your identity as a human. Thank you very much for your cooperation. Main ChEBI Ontology Automatic Xrefs Reactions Pathways Models InChI=1S/C4H10/c1-4(2)3/h4H,1-3H3 NNPPMTNAJDCUHE-UHFFFAOYSA-N food propellant A propellant that is used to expel foods from an aerosol container. refrigerant A substance used in a thermodynamic heat pump cycle or refrigeration cycle that undergoes a phase change from a gas to a liquid and back. Refrigerants are used in air-conditioning systems and freezers or refrigerators and are assigned a "R" number (by ASHRAE - formerly the American Society of Heating, Refrigerating and Air Conditioning Engineers), which is determined systematically according to their molecular structure. food propellant A propellant that is used to expel foods from an aerosol container. View more via ChEBI Ontology 2-methylpropane isobutane (CH3)2CH−CH3 IUPAC E943b ChEBI R-600a ChEBI 1301 Gmelin Registry Number Gmelin 1730720 Beilstein Registry Number Beilstein 1730720 Reaxys Registry Number Reaxys 75-28-5 CAS Registry Number ChemIDplus 75-28-5 CAS Registry Number NIST Chemistry WebBook 24179026 PubMed citation Europe PMC 24464945 PubMed citation Europe PMC Privacy Notice and Terms of Use. data-service-id=chebi data-data-protection-version=0.1> Similar records in OSTI.GOV collections: Not to be confused with butene, butyne, or Bhutan. organic compound Butane Names Preferred IUPAC name Butane[3] Systematic IUPAC name Tetracarbane (never recommended[3]) Other names Butyl hydride;[1] Quartane;[2] Refrigerant 3-11-0 Identifiers CAS Number 106-97-8 Y 3D model (JSmol) Interactive image Beilstein Reference 969129 ChEBI CHEBI:37808 Y ChEMBL ChEMBL134702 Y ChemSpider 7555 Y ECHA InfoCard 100.003.136 EC Number 203-448-7 E number E943a (glazing agents, ...) Gmelin Reference 1148 KEGG D03186 Y MeSH butane PubChem CID 7843 RTECS number EJ4200000 UNII 6LV4FOR43R Y UN number 1011 CompTox Dashboard (EPA) DTXSID7024665 InChI InChI=1S/C4H10/c1-3-4-2/h3-4H2,1-2H3 YKey: IJDNQMDRQITEOD-UHFFFAOYSA-N Y SMILES CCCC Properties Chemical formula C4H10 Molar mass 58.124 g·mol−1 Appearance Colorless gas Odor Gasoline-like or natural gas-like[1] Density 2.48 kg/m3 (at 15 °C (59 °F)) Melting point −140 to −134 °C; −220 to −209 °F; 133 to 139 K Boiling point −1 to 1 °C; 30 to 34 °F; 272 to 274 K Solubility in water 61 mg/L (at 20 °C (68 °F)) log P 2.745 Vapor pressure ~170 kPa at 283 K [4] Henry's lawconstant (kH) 11 nmol Pa−1 kg−1 Conjugate acid Butanium Magnetic susceptibility (χ) −57.4·10−6 cm3/mol Thermochemistry Heat capacity (C) 98.49 J/(K·mol) Std enthalpy offormation (ΔfH298) −126.3–−124.9 kJ/mol Std enthalpy ofcombustion (ΔcH298) −2.8781–−2.8769 MJ/mol Hazards[5] Safety data sheet See: data page GHS pictograms GHS Signal word Danger GHS hazard statements H220 GHS precautionary statements P210 NFPA 704 (fire diamond) 1 4 0SA Flash point −60 °C (−76 °F; 213 K) Autoignitiontemperature 405 °C (761 °F; 678 K) Explosive limits 1.8–8.4% NIOSH (US health exposure limits): PEL (Permissible) none[1] REL (Recommended) TWA 800 ppm (1900 mg/m3)[1] IDLH (Immediate danger) 1600 ppm[1] Related compounds Related alkanes PropaneIsobutanePentane Related compounds Perfluorobutane Supplementary data page Structure andproperties Refractive index (n),Dielectric constant (εr), etc. Thermodynamicdata Phase behavioursolid–liquid–gas Spectral data UV, IR, NMR, MS Except where otherwise noted, data are given for materials in their standard state (at 25 °C [77 °F], 100 kPa). Y verify (what is YN ?) Infobox references Chemical compound Butane (/ˈbjuːtem/) or n-butane is an alkane with the formula C4H10. Butane is a gas at room temperature and atmospheric pressure. Butane is a highly flammable, colorless, easily liquefied gas that quickly vaporizes at room temperature. The name butane comes from the roots but- (from butyric acid, named after the Greek word for butter) and -ane. It was discovered by the chemist Edward Frankland in 1849.[6] It was found dissolved in crude petroleum in 1864 by Edmund Ronalds, who was the first to describe its properties.[7][8] History This section needs expansion. You can help by adding to it. (June 2021) Butane was discovered by the chemist Edward Frankland in 1849. It was found dissolved in crude petroleum in 1864 by Edmund Ronalds, who was the first to describe its properties. Isomers Main article: C4H10 Common name normal butaneunbranched butanen-butane isobutanei-butane IUPAC name butane methylpropane Molecculardiagram Skeletaldiagram Rotation about the central C−C bond produces two different conformations (trans and gauche) for n-butane.[9] Reactions Spectrum of the blue flame from a butane torch showing CH molecular radical band emission and C2 Swan bands When oxygen is plentiful, butane burns to form carbon dioxide and water vapor; when oxygen is limited, carbon (soot) or carbon monoxide may also be formed. Butane is denser than air. When there is sufficient oxygen: 2 C4H10 + 13 O2 → 8 CO2 + 10 H2O When oxygen is limited: 2 C4H10 + 9 O2 → 8 CO + 10 H2O By weight, butane contains about 49.5 MJ/kg (13.8 kWh/kg; 22.5 MJ/lb; 21,300 Btu/lb) or by liquid volume 29.7 megajoules per liter (8.3 kWh/l; 112 MJ/U.S. gal; 107,000 Btu/U.S. gal). The maximum adiabatic flame temperature of butane with air is 2,243 K (1,970 °C; 3,578 °F). n-Butane is the feedstock for DuPont's catalytic process for the preparation of maleic anhydride: 2 CH3CH2CH2CH3 + 7 O2 → 2 C2H2(CO)2O + 8 H2O n-Butane, like all hydrocarbons, undergoes free radical chlorination providing both 1-chloro- and 2-chlorobutanes, as well as more highly chlorinated derivatives. The relative rates of the chlorination is partially explained by the differing bond dissociation energies, 425 and 411 kJ/mol for the two types of C-H bonds. Uses Normal butane can be used for gasoline blending, as a fuel gas, fragrance extraction solvent, either alone or in a mixture with propane, and as a feedstock for the manufacture of ethylene and butadiene, a key ingredient of synthetic rubber. Isobutane is primarily used by refineries to enhance (increase) the octane number of motor gasoline.[10][11][12][13] When blended with propane and other hydrocarbons, it may be referred to commercially as LPG, for liquefied petroleum gas. It is used as a petrol component, as a feedstock for the production of base petrochemicals in steam cracking, as fuel for cigarette lighters and as a propellant in aerosol sprays such as deodorants.[14] Very pure forms of butane, especially isobutane, can be used as refrigerants and have largely replaced the ozone-layer-depleting halomethanes, for instance in household refrigerators and freezers. The system operating pressure for butane is lower than for the halomethanes, such as R-12, so R-12 systems such as in automotive air conditioning systems, when converted to pure butane will not function optimally and therefore a mix of isobutane and propane is used to give cooling system performance comparable to R-12. Butane is also used as lighter fuel for a common lighter or butane torch and is sold bottled as a fuel for cooking, barbecues and camping stoves. The global market for butane canisters is dominated by South Korean manufacturers.[15] As fuel, it is often mixed with small amounts of hydrogen sulfide and mercaptans which will give the unburned gas an offensive smell easily detected by the human nose. In this way, butane leaks can easily be identified. While hydrogen sulfide and mercaptans are toxic, they are present in levels so low that suffocation and fire hazard by the butane becomes a concern far before toxicity.[16][17] Most commercially available butane also contains a certain amount of contaminant oil which can be removed through filtration but which will otherwise leave a deposit at the point of ignition and may eventually block the uniform flow of gas.[18] The butane used in fragrance extraction does not contain these contaminants[19] and butane gases can cause gas explosions in poorly ventilated areas if leaks go unnoticed and are ignited by spark or flame.[5]Butane in its purest form is also used as a solvent in the industrial extraction of cannabis oils. Butane fuel canisters for use in camping stoves Butane lighter, showing liquid butane reservoir An aerosol spray can, which may be using butane as a propellant Butane gas cylinder used for cooking Effects and health issues Inhalation of butane can cause euphoria, drowsiness, unconsciousness, asphyxia, cardiac arrhythmia, fluctuations in blood pressure and temporary memory loss, when abused directly from a highly pressurized container, and can result in death from asphyxiation and ventricular fibrillation. It enters the blood supply and within seconds produces intoxication.[20] Butane is the most commonly abused volatile substance in the UK, and was the cause of 52% of solvent related deaths in 2000.[21] By spraying butane directly into the throat, the jet of fluid can cool rapidly to −20 °C (−4 °F) by expansion, causing prolonged laryngospasm.[22] "Sudden sniffer's death" syndrome, first described by Bass in 1970,[23] is the most common single cause of solvent related death, resulting in 55% of known fatal cases.[22] See also Isobutane Cyclobutane Dimethyl ether Volatile substance abuse Butane (data page) Butanone n-Butanol Liquefied petroleum gas Industrial gas Butane torch Gas explosions References ^ a b c d e NIOSH Pocket Guide to Chemical Hazards. "#0068". National Institute for Occupational Safety and Health (NIOSH). ^ Hofmann, August Wilhelm Von (1 January 1867). "I. On the action of trichloride of phosphorus on the salts of the aromatic monamines". 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International Chemical Safety Card 0232 NIOSH Pocket Guide to Chemical Hazards Retrieved from " 2 1-Butene Names Preferred IUPAC name But-1-ene[1] Other names Ethylethylene1-Butyleneα-Butylene Identifiers CAS Number 106-98-9 Y 3D model (JSmol) Interactive imageInteractive image Beilstein Reference 1098262 ChEBI CHEBI:48362 Y ChEMBL ChEMBL117210 Y ChemSpider 7556 Y ECHA InfoCard 100.003.137 EC Number 203-449-2 Gmelin Reference 25205 PubChem CID 7844 UNII LY001N554L Y UN number 1012 CompTox Dashboard (EPA) DTXSID1026746 InChI InChI=1S/C4H8/c1-3-4-2/h3H,1,4H2,2H3 YKey: VXNZUUAINFGPBY-UHFFFAOYSA-N YInChI=1/C4H8/c1-3-4-2/h3H,1,4H2,2H3Key: VXNZUUAINFGPBY-UHFFFAOYAZ SMILES C=CCCCC=C Properties Chemical formula C4H8 Molar mass 56.108 g·mol−1 Appearance Colorless Gas Odor slightly aromatic Density 0.62 g/cm3 Melting point −185.3 °C (−301.5 °F; 87.8 K) Boiling point −6.47 °C (20.35 °F; 266.68 K) Solubility in water 0.221 g/100 mL Solubility soluble in alcohol, ether, benzene Refractive index (nD) 1.3962 Viscosity 7.76 Pa Hazards GHS pictograms GHS Signal word Danger GHS hazard statements H220, H221, H280 GHS precautionary statements P210, P377, P381, P403, P410+P403 NFPA 704 (fire diamond) 1 4 0 Flash point −79 °C; −110 °F; 194 K Autoignitiontemperature 385 °C (725 °F; 658 K) Explosive limits 1.6-10% Except where otherwise noted, data are given for materials in their standard state (at 25 °C [77 °F], 100 kPa). N verify (what is YN ?) Infobox references Chemical compound 1-Butene (or 1-Butylene) is the organic compound with the formula CH3CH2CH=CH2. It is a colorless gas that is easily condensed to give a colorless liquid. It is classified as a linear alpha-olefin.[2] It is one of the isomers of butene (butylene). It is a precursor to diverse products. Reactions Polymerization of 1-butene give polybutene, which is used to make piping for domestic plumbing.[3] Its main application is as a comonomer in the production of certain kinds of polyethylene, such as linear low-density polyethylene (LLDPE).[4] It has also been used as a precursor to polypropylene resins, butylene oxide, and butanone.[5] Manufacturing 1-Butene is produced by separation from crude C4 refinery streams and by ethylene dimerization. The former affords a mixture of 1-and 2-butenes, while the latter affords only the terminal alkene.[6] It is distilled to give a very high purity product. An estimated 12 billion kilograms were produced in 2011.[7] See also Butene Dimer (chemistry) Octene References ^ Nomenclature of Organic Chemistry : IUPAC Recommendations and Preferred Names 2013 (Blue Book). Cambridge: The Royal Society of Chemistry. 2014. pp. 17, 61, 374. doi:10.1039/9781849733069-FP001. ISBN 978-0-85404-182-4. ^ "1-BUTENE". chemicalland21.com. Retrieved 22 April 2018. ^ Whiteley, Kenneth S.; Heggs, T. Geoffrey; Koch, Hartmut; Mawer, Ralph L.; Immel, Wolfgang (2000). "Polyolefins". Ullmann's Encyclopedia of Industrial Chemistry. Weinheim: Wiley-VCH. doi:10.1002/14356007.a21_487. ^ Chum, P. Steve; Swogger, Kurt W. (2008). "Olefin polymer technologies—History and Recent Progress at the Dow Chemical Company". Progress in Polymer Science. 33 (8): 797–819. doi:10.1016/j.progpolymsci.2008.05.003. ^ "1-Butene product overview". shell.com. Archived from the original on 2012-02-10. Retrieved 22 April 2018. ^ "Alphabutol process - Big Chemical Encyclopedia". chempedia.info. 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