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## 12- 4 derivatives formula sheet pdf download

Piperidine[1] Names IUPAC name Piperidine Preferred IUPAC name Piperidine[2] Other names HexahydropyridineAzacyclohexanePentamethyleamineAzinane Identifiers CAS Number 110-89-4 Y 3D model (JSmol) Interactive image CHEBI CHEBI:18049 Y ChEMBL ChEMBL15487 Y ChemSpider 7791 Y ECHA InfoCard 100.003.467 EC Number 203-813-0 IUPHAR/BPS 5477 KEGG C01746 PubChem CID 8082 RTECS number TM3500000 UNII 67185E138Y Y UN number 2401 CompTox Dashboard (EPA) DTXSID6021165 InChI InChI=1S/C5H11N/c1-2-4-6-5-3-1/h6H,1-5H2 YKey: NQRYJNQNLNOLGT-UHFFFAOYSA-N YInChI=1/C5H11N/c1-2-4-6-5-3-1/h6H,1-5H2InChI=1/C5H11N/c1-2-4-6-5-3-1/h6H,1-5H2Key: NQRYJNQNLNOLGT-UHFFFAOYAY SMILES C1CCNCC1 Properties Chemical formula C5H11N Molar mass 85.150 g·mol−1 Appearance Colorless liquid Odor Semen-like,[3] fishy-ammoniacal, pungent Density 0.862 g/mL Melting point −7 °C (19 °F; 266 K) Boiling point 106 °C (223 °F; 379 K) Solubility in water Miscible Acidity (pKa) 11.22[4][5] Magnetic susceptibility (χ) −64.2·10−6 cm3/mol Viscosity 1.573 cP at 25 °C Hazards GHS labelling: Pictograms Signal word Danger Hazard statements H225, H311, H314, H331 Precautionary statements P210, P233, P240, P241, P242, P243, P260, P261, P264, P271, P280, P301+P330+P331, P302+P352, P303+P361+P353, P304+P340, P305+P351+P338, P310, P311, P312, P321, P322, P361, P363, P370+P378, P403+P233, P403+P235, P405, P501 NFPA 704 (fire diamond) 3 3 0 Safety data sheet (SDS) MSDS1, MSDS2 Related compounds Related compounds PyridinePyrrolidinePiperazinePhosphorinaneArsinane 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 Piperidine is an organic compound with the molecular formula (CH2)5NH. This heterocyclic amine consists of a six-membered ring containing five methylene bridges (−CH2−) and one amine bridge (−NH−). It is a colorless liquid with an odor described as objectionable, and typical of amines.[6] The name comes from the genus name Piper, which is the Latin word for pepper.[7] Although piperidine is a common organic compound, it is best known as a representative structure element within many pharmaceuticals and alkaloids, such as natural-occurring solenopsins.[8] Production Piperidine was first reported in 1850 by the Scottish chemist Thomas Anderson and again, independently, in 1852 by the French chemist Auguste Cahours, who named it.[9][10][11] Both of them obtained piperidine by reacting piperine with nitric acid. Industrially, piperidine is produced by the hydrogenation of pyridine, usually over a molybdenum disulfide catalyst.[12] C5H5N + 3 H2 → C5H10NH Pyridine can also be reduced to piperidine via a modified Birch reduction using sodium in ethanol.[13] Natural occurrence of piperidine and derivatives Piperidine itself has been obtained from black pepper,[14][15] from Psilocaulon absimile (Aizoaceae),[16] and in Petrosimonia monandra.[17] The piperidine structural motif is present in numerous natural alkaloids. These include piperine, which gives black pepper its spicy taste. This gave the compound its name. Other examples are the fire ant toxin solenopsin,[18] the nicotine analog anabasine of tree tobacco (Nicotiana glauca), lobeline of Indian tobacco, and the toxic alkaloid coniine from poison hemlock, which was used to put Socrates to death.[19] Conformation Piperidine prefers a chair conformation, similar to cyclohexane. Unlike cyclohexane, piperidine has two distinguishable chair conformations: one with the N-H bond in an axial position, and the other in an equatorial position. After much controversy during the 1950s–1970s, the equatorial conformation was found to be more stable by 0.72 kcal/mol in the gas phase.[20] In nonpolar solvents, a range between 0.2 and 0.6 kcal/mol has been estimated, but in polar solvents the axial conformer may be more stable.[21] The two conformers interconvert rapidly through nitrogen inversion; the free energy activation barrier for this process, estimated at 6.1 kcal/mol, is substantially lower than the 10.4 kcal/mol for ring inversion.[22] In the case of N-methylpiperidine, the equatorial conformation is preferred by 3.16 kcal/mol,[20] which is much larger than the preference in methylcyclohexane, 1.74 kcal/mol. axial conformation equatorial conformation Reactions Piperidine is a widely used to convert ketones to enamines.[23] Enamines derived from piperidine are substrates in the Stork enamine alkylation reaction.[24] Upon treatment with calcium hypochlorite, piperidine converts to N-chloropiperidine, a chloramine with the formula C5H10NCl. The resulting chloramine undergoes dehydrohalogenation to afford the cyclic imine.[25] NMR chemical shifts 13C NMR: (CDCl3, ppm) 47.27.2, 25.2[citation needed] 1H NMR: (CDCl3, ppm) 2.79, 2.19, 1.51[citation needed] Uses Piperidine is used as a solvent and as a base. The same is true for certain derivatives: N-formylpiperidine is a polar aprotic solvent with better hydrocarbon solubility than other amide solvents, and 2,2,6,6-tetramethylpiperidine is a highly sterically hindered base, useful because of its low nucleophilicity and high solubility in organic solvents. A significant industrial application of piperidine is for the production of dipiperidinyl dithuram tetrasulfide, which is used as an accelerator of the sulfur vulcanization of rubber.[12] List of piperidine medications Minoxidil is a piperidine derivative widely used to prevent hair loss. Piperidine and its derivatives are ubiquitous building blocks in pharmaceuticals[26] and fine chemicals. The piperidine structure is found in, for example: Icaridin (insect repellent) SSRIs (selective serotonin reuptake inhibitors) Paroxetine stimulants and nootropics: Methylphenidate Ethylphenidate Pipradrol Desoxyppiradrol SERM (selective estrogen receptor modulators) Raloxifene Vasodilators Minoxidil Antipsychotic medications: Droperidol Haloperidol Melperone Mesoridazine Risperidone Thioridazine Opioids: Dipipanone Fentanyl and analogs Loperamide Pethidine (meperidine) Prodine Arylcyclohexylamines: PCP and analogs anticholinergic chemical weapons Ditrán N-Methyl-3-piperidyl benziolate (JB-336, BZ) Piperidine is also commonly used in chemical degradation reactions, such as the sequencing of DNA in the cleavage of particular modified nucleotides. Piperidine is also commonly used as a base for the deprotection of Fmoc-amino acids used in solid-phase peptide synthesis. Piperidine is listed as a Table II precursor under the United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances due to its use (peaking in the 1970s) in the clandestine manufacture of PCP (1-(1-phenylcyclohexyl)piperidine, also known as angel dust, sherms, wet, etc.).[27] References ↑ "International Chemical Safety Card 0317". ↑ "Front Matter". Nomenclature of Organic Chemistry : IUPAC Recommendations and Preferred Names 2013 (Blue Book). Cambridge: The Royal Society of Chemistry. 2014. p. 142. doi:10.1039/9781849733069-PP001. ISBN 978-0-85404-182-4. ↑ Amoire, J. E. (1975). "Specific anosmia to 1-pyrroline: The spermous primary odor". *J. Chem. Ecol.* **1** (3): 299–310. doi:10.1007/BF00988831. S2CID 19318345. ↑ Hall, H. K. (1957). "Correlation of the Base Strengths of Amines". *J. Am. Chem. 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