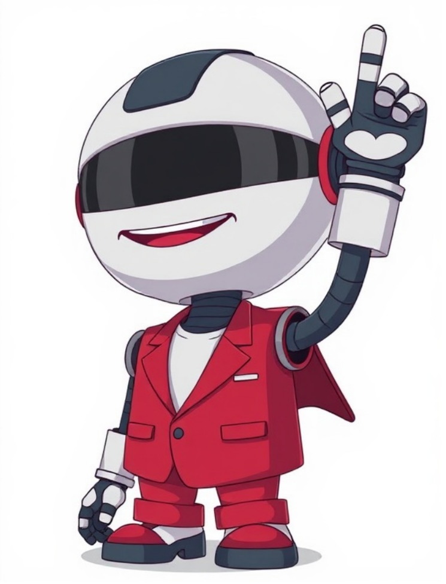
I'm not a bot



Cyanamide is a substance with multiple names, including amidocyanogen, carbanonitrile, aminoformonitrile, cyanogenamide, hydrogen cyanamide, and carbodiimide. It has various applications, such as a plant growth regulator to promote bud break and rest-breaking agent for fruits like blueberries, grapevines, apples, cherries, kiwi, peaches, nectarines, onions, leeks, shallots, garlic, and chives. Cyanamide is also used in the production of various chemicals. However, it has some environmental concerns, including being a potential groundwater contaminant and having moderate ecotoxicity to birds, fish, daphnia, bees, and earthworms. Humans may be exposed to cyanamide through its use as a pesticide or chemical intermediate, which could pose health risks, such as reproduction/development effects and possible carcinogenic properties. In terms of regulations, cyanamide is not approved for use in the UK as a plant protection agent, but it has been registered in other countries like Australia and the USA. The substance is also subject to PIC regulations due to its potential impact on human health and the environment. When handling cyanamide, it's essential to follow proper safety protocols, including wearing protective gear and ensuring adequate ventilation, as it can release harmful fumes when mixed with water. Overall, cyanamide is a complex chemical with both beneficial and concerning properties that require careful management and regulation to minimize its potential risks to humans and the environment. =================================== EC, EFSA, and EMA have published regulatory data on n-Hexane and Toluene, which are used as pesticides. The data includes information on their properties, such as boiling points, volatility, and persistence. N-Hexane has a boiling point of 670°C and is considered highly volatile, making it a concern for drift if applied directly to plants or soil. In contrast, Toluene has a lower boiling point of 46.1°C and is less volatile. The data also shows that n-Hexane has a high log P value, indicating its potential for persistence in the environment. On the other hand, Toluene has a low log P value, suggesting it may be more susceptible to degradation. Additionally, n-Hexane is considered highly persistent, with a half-life of 2.68 x 10^-5 years. The regulatory data also includes information on the phototoxicity and cytotoxicity of these substances. N-Hexane is not expected to have significant effects on aquatic life, while Toluene may have some toxic effects on microorganisms. However, more research is needed to fully understand the potential risks associated with these pesticides. =================================== This article discusses the different types of data used in EU regulatory and evaluation processes for pesticides, including non-persistent, persistent, and mobile substances. Non-persistent substances have a short half-life and do not accumulate in the environment, while persistent substances can persist for long periods of time. Mobile substances are easily transported through the environment. The article categorizes these substances into five groups based on their persistence and mobility: A2 (non-persistent), A3 (unverified data of known source), A4 (unverified data of unknown source), A5 (persistent and mobile), and A6 (stable but not very persistent). Substance A2, which has a short half-life, is considered to have low environmental risk. Substance A3, which has unverified data, is also considered to be of low risk. The article highlights the importance of verifying data through laboratory studies and field trials to determine the persistence and mobility of substances. This information is used to assess the potential risks associated with these substances and to develop strategies for their management. Overall, the article emphasizes the need for accurate and reliable data on pesticide substances to inform EU regulatory decisions and ensure public health and environmental protection.Colinus virginianus has been evaluated for its toxicity in various contexts, with data suggesting moderate effects on some species but no significant adverse impacts on others. =================================== Nitrogen mineralisation and carbon mineralisation tests conducted at doses of 98 kg ha^{-1} and 100 kg ha^{-1}, respectively, revealed no substantial negative consequences. These findings are corroborated by European regulatory and evaluation data published by EC, EFSA, EMA, and the EU Pesticides database. =================================== Data obtained from Lycopersicum lycopersicum indicates that the species is relatively non-toxic to humans. In contrast, Allium cepa showed moderate toxicity at certain concentrations. =================================== Apis mellifera exhibited moderate sensitivity to pesticides, while Chrysoperla carnea and Aphidius rhopalosiphi displayed low levels of toxicity. A notable exception was Typhlodromus pyri, which demonstrated extremely low mortality rates even at high doses. =================================== Poecilus cupreus and Lepomis macrochirus showed moderate toxicity in these studies, whereas Oncorhynchus mykiss exhibited limited effects. Daphnia magna displayed moderate sensitivity to pesticides, while Americamysis bahia also exhibited moderate toxicity. Chironomus riparius displayed low emergence rates at certain concentrations. =================================== These results collectively indicate that Colinus virginianus is generally non-toxic to humans and other organisms, although some species may exhibit moderate levels of sensitivity or toxicity in specific contexts. =================================== Lemna gibba and Pseudokirchneriella subcapitata: Evaluation Data as Published by EC, EFSA, and EMA The European Chemicals Agency (EC), the European Food Safety Authority (EFSA), and the European Medicines Agency (EMA) have published evaluation data on Lemna gibba and Pseudokirchneriella subcapitata. According to EU regulatory and evaluation data as published by EC, EFSA, and EMA, Lemna gibba is classified as Moderate for human health and protection, with a toxicity class of A5. Similarly, Pseudokirchneriella subcapitata is also classified as Moderate, with a toxicity class of A5. Rat exposure studies indicate that both Lemna gibba and Pseudokirchneriella subcapitata exhibit moderate toxicity, with an LC50 value of 848 mg/kg for Rat. The EU MRL pesticide database lists these substances as being of concern due to their potential for endocrine disruption. The EU limit for Lemna gibba is set at 0.1 mg/kg bw/day, while Pseudokirchneriella subcapitata has a recommended acute daily exposure limit (RADEL) of 5-100 µg/kg bw. These substances have been identified as potential neurotoxins and irritants, with Acetyl cholinesterase inhibition and respiratory tract irritation reported in scientific studies. However, further research is needed to fully understand the risks associated with their use. In terms of handling and storage, Lemna gibba and Pseudokirchneriella subcapitata require careful attention due to their potential for generating dust and reacting with acids to produce toxic gases. The European Chemicals Agency (EC), the European Food Safety Authority (EFSA), and the European Medicines Agency (EMA) have published evaluation data on Lemna gibba and Pseudokirchneriella subcapitata, highlighting concerns over their potential toxicity and environmental impact.carbodiimide isomer: N=C=N =================================== carbodiimide is an organic compound with the formula CN2H2. This white solid is widely used in agriculture and the production of pharmaceuticals and other organic compounds. It is also used as an alcohol-deterrent drug. The molecule features a nitrile group attached to an amino group. =================================== The key chemical feature of carbodiimide is its ability to form complexes with nucleophilic groups, making it useful for various reactions in the field of pharmaceuticals and agriculture. It can be regarded as a functional single carbon fragment which can react as an electrophile or nucleophile. =================================== This versatile compound can undergo several transformations, including hydration reactions and the formation of heterocycles. Its unique properties make it a valuable component in the production of various chemicals, such as imatinib, amitrol, and hexazinone. Additionally, its anti-ulcer drug cimetidine is generated using reactivity involving bifunctionality of cyanamide. =================================== =================================== Cyanamide plays a crucial role in the synthesis of various pharmaceutical drugs, including tirapazamine, etravirine, revaprazan, and dasantafil. Its unique properties as a pseudo-chalcogen make it an ideal analogue for water or hydrogen sulfide. A convenient method to prepare secondary amines without contamination involves reacting cyanamide with alkyl halides to form N,N-dialkylcyanamides, which can be easily hydrolyzed to dialkylamines and then decarboxylated. cyanamides can be produced from thioureas, sometimes with rearrangement[21]: 1390–1392. Isonitrile dichlorides react with ammonia to form cyanamides.[21]: 1392 As a more stable valence isomer of carbodiimides, cyanamides are formed when carbodiimides are heated or undergo electrophilic substitution.[21]: 1393 Secondary cyanamides are stabler, but primary cyanamides trimerize to the corresponding 1,3,5-triazine.[21]: 1398 Cyanamides are more acidic and less basic than alkylamines, protonating at the terminal nitrogen. However, nickel(0) complexes are known in which nickel coordinates to both nitrogen atoms. When protonated, the central carbon is very electrophilic, and will add a variety of nucleophiles.[21]: 1393–1395, 1399 Due to its high permanent dipole moment (i.e., 4.32 ± 0.08 D),[22] cyanamide was detected in spectral emissions coming from the Sgr B2 molecular cloud ($T < 100$ K) through its microwave transitions as the first known interstellar molecule containing the NCN frame.[23] It is used as an alcohol-deterrent drug in Canada, Europe, and Japan.[3] Cyanamide has a modest toxicity in humans.[24] Workplace exposure to hydrogen cyanamide sprays or exposure in people living in the vicinity of spraying have been reported as causing respiratory irritation, contact dermatitis, headache, and gastrointestinal symptoms of nausea, vomiting, or diarrhea.[24] ^ "Cyanamide_msds". ^ a b NIOSH Pocket Guide to Chemical Hazards. "#0160". National Institute for Occupational Safety and Health (NIOSH). ^ a b c d e Thomas Güthner; Bernd Mertschenk (2006). "Cyanamides". Ullmann's Encyclopedia of Industrial Chemistry. Weinheim: Wiley-VCH. doi:10.1002/14356007.a08_139.pub2. ISBN 3527306730. ^ Kurzer, Frederick; Lawson, Alexander (1954). "Methylisourea Hydrochloride". Organic Syntheses. 34: 67. doi:10.15227/orgsyn.034.0067. ^ Jonczyk A, Ochal Z, Makosza M (1978). "Reactions of Organic Anions; LXXXV1. Catalytic Two-Phase Alkylation of Cyanamide". Synthesis. 1978 (12): 882–883. doi:10.1055/s-1978-24922. ^ Ponsold K, Ihn W (1970). "Die Addition von cyanamid und Halogen an Olefine ein neues Verfahren zur Darstellung von vic.-Halogencyanaminen und Aziridinen". Tetrahedron Lett. 11 (13): 1125–1128. doi:10.1016/S0040-4039(01)97925-0. PMID 5439242. ^ Kohn, Harold; Jung, Sang Hun (1983). "New stereoselective method for the preparation of vicinal diamines from olefins and cyanamide". Journal of the American Chemical Society. 105 (12): 4106–4108. Bibcode:1983JAChS.105.4106K. doi:10.1021/ja00350a068.. ^ Weiss, Stefan; Michaud, Horst; Prietzel, Horst; Krommer, Helmut (1973). "A New, Simple Synthesis of 2-Aminobenzimidazole". Angewandte Chemie International Edition in English. 12 (10): 841. doi:10.1002/anie.197308411.. ^ S. Hünig, E. Lücke, and W. Brenninger (1961). "1-Morpholino-1-Cyclohexene". Organic Syntheses: 65. doi:10.15227/orgsyn.041.0065{{cite journal}}: CS1 maint: multiple names: authors list (link). ^ Gewald, K.; Spies, H.; Mayer, R. (1970). "Zur Reaktion von Enaminen mit Schwefel und Cyanamid" [On the Reaction of Enamines with Sulfur and Cyanamide]. Journal für Praktische Chemie. 312 (5): 776–779. doi:10.1002/prac.19703120507.. ^ a b E. B. Vliet (1925). "Diallylcyanamide". Organic Syntheses. 5: 45. doi:10.15227/orgsyn.005.0045. ^ Verfahren zur Herstellung von Natrium-Dicyanamid, veröffentlicht am 10. August 2000, Anmelder: SKW Trostberg AG. ^ "Sodium dicyanamide (Na-dicyanamide)". lonza.com. Archived from the original on 2013-05-23. Retrieved 2019-07-01. ^ Deutsche Offenlegungsschrift DE-OS 10 2006 016 227 A1, Offenlegungsdatum: 11. Oktober 2007, Anmelder: Degussa GmbH ^ Wehrstedt, Klaus-Dieter; Wildner, Werner; Güthner, Thomas; Holzrichter, Klaus; Mertschenk, Bernd; Ulrich, Armin (2009-10-30). "Safe transport of cyanamide". Journal of Hazardous Materials. 170 (2–3): 829–835. Bibcode:2009JHzM..170..829W. doi:10.1016/j.jhazmat.2009.05.043. ISSN 0304-3894. PMID 19505756. ^ Powell, A. (1999). "Action Program for Dormex Application on Peaches". Auburn University. Archived from the original on 2018-06-20. ^ "ALZOGUR®". AlzChem (in German). Retrieved 2019-07-01. =================================== Cyanamide is a chemical compound that is often used to produce other useful substances. It can be derived from guanidine and is also found in soil when cyanamide decomposes naturally. The molecule has a distinct structure, with a nitrile group attached to it. The properties of cyanamide are quite unique, making it a valuable component in various industrial applications. For instance, it can be used as a slow fertilizer or even as a fuel in certain explosives. Additionally, cyanamide is utilized in the adhesive industry to enhance the curing process of epoxy resins. Interestingly, there are different forms of cyanamide that can exist under varying conditions. These include two tautomeric structures and a zwitterionic form, which can undergo chemical reactions to produce other compounds.The cyanamides are a class of organic compounds that contain a cyano group (-CN) attached to a nitrogen-containing heterocycle. =================================== CN2H2, or cyanamide, has a Lewis structure that consists of connecting the atoms with single bonds. The number of electrons in π bonds can be calculated using the formula: $n = 6n + 2 – V$, where n is the number of non-hydrogen atoms and V is the total number of valence electrons. For CN2H2, $n = 3$ and $V = 16$, resulting in either two double bonds or one triple bond. The Lewis dot structures show that Structure #1 is more stable due to its adherence to the Octet Rule and lack of charge separation. Cyanamide has various applications, including synthesizing modern pesticides, pharmaceuticals, and organic synthesis, as well as being used in manufacturing synthetic resins and insulating materials for electric applications. It was initially available in small quantities from 1962, with larger market launches beginning in 1965. Every large chemical company was offered test quantities of the versatile and highly reactive cyanamide substance.