

# Hydrogen Cyanamide

FROM THE LEADER IN  
CYANAMIDE CHEMISTRY



alzchem  
group

# APPLICATIONS FOR HYDROGEN CYANAMIDE



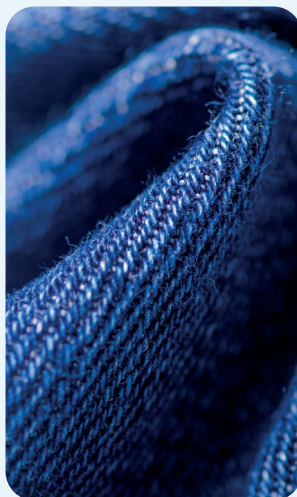
## AGRI SOLUTIONS

- Amitrol (Herbicide against weeds)
- Pyrimethanil (fungicide on tropical fruits)



## BIOCIDES

- Disinfectant



## DYESTUFF

- Color fixation in textile applications

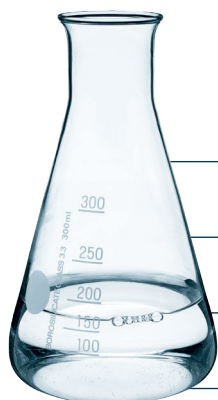


## PHARMA

- Fenbendazol or Albendazol (antiworm medicine: human and animal)
- Imatinib (chronic leukemia)

## SPECIFICATION

CAS (420-04-2)



### Cyanamide L500

stabilized 50 % aqueous solution of Cyanamide

49–51%

max. 1,5%

-

max. 2%

Assay

Dicyandiamide

Water

Stabilizer

### Cyanamide F1000

stabilized, crystalline Cyanamide colourless, hygroscopic crystals

min. 99%

max. 1%

max. 1%

max. 0.5%



## RANGE OF STABILITY

**pH**    UNSTABLE HYDROLIZES    **3,5**    LIMITED STABILITY    **4,0**    HIGHEST STABILITY    **4,5**    LIMITED STABILITY    **5,5**    UNSTABLE DIMERIZES

# Your Benefits

As the leader in Cyanamide chemistry, we are pleased to offer a full service for Hydrogen Cyanamide:

- Assistance for your chemical synthesis
- Custom synthesis with Cyanamide
- On time delivery all over the world
- Full technical service at your production plant
- Customized process development
- Education and training of your staff to ensure safe handling
- Assistance in building storage facilities at your plant optimizing
- Return of surplus Cyanamide
- Sustainability: iso-container as preferred packaging



**BACKWARD INTEGRATED PRODUCTION**

## PHYSICAL PROPERTIES

Melting point	46 °C	
Vapour pressure (at 20 °C)	5 x 10 <sup>-3</sup> mbar	
Refraction index (melt)	nD48 1.441	
Crystal density	1.282 g/cm <sup>3</sup>	
Enthalpy of formation (at 25 °C)	+ 61.3 kJ/mol	
Specific heat (0-39 °C)	2.29 J/g x K	
Heat of fusion	8.76 kJ/mol	208.5 J/g
Heat of vaporization	70.5 kJ/mol	1677 J/g
Heat of solution (in water)	15.1 kJ/mol	359 J/g
Enthalpy of dimerization (forming Dicyandiamide, at 25 °C)	48.8 kJ/mol	- 1161 J/g
Enthalpy of hydration(forming urea, at 25 °C)	- 109 kJ/mol	2582 J/g
Dissociation constant (forming HNCN-)	5.4 x 10 <sup>-11</sup>	pKa = 10.3

## SUSTAINABILITY AND CORPORATE SOCIAL RESPONSIBILITY AT ALZCHEM

### TRADITION MEETS SUSTAINABILITY

- Excellent dealing with people and the environment
- Successful reduction of the annual CO<sub>2</sub> emissions by ~ 50,000 tons\*
- Spending of ~ 24 M€\* annually in the protection of the environment
- Successful audits of the Trostberg site by the industry initiative "Together for Sustainability"
- Commitment to compliance with responsible care guidelines

\* data basis 2022



## STABILITY

Cyanamide is an instable substance that can react with itself or other reactants releasing potentially dangerous exothermal heat. Dimerization of Cyanamide in alkaline environment gives dicyandiamide, while addition of water in acidic media leads to urea. To prevent from these degradation reactions, a buffering stabilizer is added to all Cyanamide products. This stabilizer ensures a maximum quality lifetime and safe transport and storage.

Cyanamide is stable in the pH range from 4 to 6 with optimum stability at pH 4.0 to 4.5. Avoid all contact with alkaline or acidic compounds as long it is not the anticipated reaction under controlled conditions.

Uncontrolled heat-up of solid Cyanamide F1000 can lead to a maximum decomposition temperature of more than 500 °C, with release of toxic gases and potentially severe damages.

## PHYSIOLOGIC PROPERTIES AND TOXICOLOGY

Pure cyanamide is toxic if swallowed and harmful in contact with skin. It is organ toxic with long-term effects. It is suspect of causing cancer, damaging fertility and damaging the unborn child.

Cyanamide is corrosive to the skin and eyes. It has sensitizing properties and is capable to cause eczema-like rashes even after short-term skin contact.

Harmful to aquatic life with long lasting effects.

## SOLUBILITY

Cyanamide is highly soluble in water, aliphatic alcohols, ethers, esters and amides. It is insoluble in aliphatic hydrocarbons. Ketones, amines and acids are not suitable as solvents. The Cyanamide/water eutectic solidifies at -16.6 °C.

## REACTIVITY

Cyanamide may be regarded as the amide of cyanic acid or as the nitrile of carbamic acid. The difunctional molecule is capable of reacting as a nucleophile at the amino group or as an electrophile at the cyano group. Many reactions include both reactive sites forming heterocycles.

## BACKWARD INTEGRATED PRODUCTION



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