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|  | SAFETY DATA SHEET MNB (KAVIST® PLUS) | Version 07 April 2017 |
| | M-DIR-PF-05 | Pág. 1 de 6 |
| Elaborated by: Sánchez, G. | Reviewed by: Sánchez, G. | Approved by: Nater, G. |
| Summary of changes: Update to the physical properties | | |

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product information

Commercial Name: MNB–MENADIONE NICOTINAMIDE BISULFITE–FEED GRADE (KAVIST® PLUS)

1.2 Recommended uses of the substance or mixture: Additive for animal nutrition to be used in feed

1.3 Details of the supplier: **DIROX S.A.**

Industrial Plant: Ruta Nacional Nº 1 Km. 48
C.P. 80.100 Libertad - San José -Uruguay

Commercial Office: Tomás Diago 748
C.P. 11.300 – Montevideo -Uruguay
Tel: +598 2710 6351 – 2710 4348
Fax: +598 2711 7516
e-mail: dirox@dirox.com.uy

1.4 Emergency telephone: +598 4345 4186 Int. 110

2. HAZARDS IDENTIFICATION

2.1 GHS Classification according to Dec. 307/2009 (Uruguay)

Signal word: WARNING

Pictogram(s):



Category

Skin irritation: Category 2
Eye irritation: Category 2
Specific target organ toxicity
- single exposure: Category 3
Acute aquatic toxicity: Category 1
Chronic aquatic toxicity: Category 1

Hazard statements

H315: Causes skin irritation.
H319: Causes serious eye irritation.

H335: May cause respiratory irritation.
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects.

Precautionary statements:

Prevention:

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Wash skin thoroughly after handling.
P273 Avoid release to the environment.
P280 Wear protective gloves/eye protection/face protection.

Response:

P302 + P 352 IF ON SKIN: Wash with plenty of soap and water.
P304 +P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312: Call a POISON CENTER or doctor/physician if you feel unwell
P391: Collect spillage.


Storage and disposal

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P501: Dispose of contents/container in accordance with local/regional/national/international regulation

2.2 Classification according (67/548 and 1999/45) EC

Xi-Irritant: R36/37/38: Irritating to eyes, respiratory system and skin.

N-Dangerous for the environment R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substance:

Chemical Name: 1,2,3,4-tetrahydro-2-methyl-1,4-dioxonaphthalene-2-sulphonic acid, compound with nicotin-3-amide (1:1) (blended with carrier)

Chemical Formula: C₁₁H₁₀O₅S.C₆H₆N₂O

3.2 Hazardous components:

| Substance | CAS-No / EINECS-No | Concentration | Classification | Classification GHS |
|----------------------------------|-------------------------|-----------------------------------|--------------------------------|--|
| Menadione nicotinamide bisulfite | 73581-79-0 277-543-7 | 50 % min. (on anhydrous basis) | Xi; N; R36/37/38 R50-R53 | Skin Irrit. 2: H315 Eye Irrit. 2: H319 STOT SE 3: H335 Aquatic Acute 1:H400 Aquatic Chronic 1:H410 |

The product is an adduct of menadione bisulfite-nicotinamide (diluted and stabilized with calcium carbonate).

4. FIRST AID MEASURES

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Flush nose and mouth with cold water. If irritation persists, get medical attention.

Skin contact: Take off contaminated clothing and shoes immediately. Wash off with plenty of water. If symptoms persist, get medical attention. Wash contaminated clothing before reusing.

Eye contact: Rinse with plenty of water to the affected area, keeping eyelids open. Check for and remove any contact lenses. If irritation persists, get medical attention.

Ingestion: Rinse mouth with water and drink plenty of water afterwards. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Obtain medical attention.

5. FIREFIGHTING MEASURES

5.1 Extinguishing media:


In case of fire, use water spray (fog), foam, dry chemical or CO₂.

5.2 Special hazards arising from the substance or mixture:

Do not allow run-off from fire fighting to enter drains or water courses.

5.3 Advice for firefighters:

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

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6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions:

Use personal protective equipment
Avoid dust formation and breathing, provide ventilation.

6.2 Environmental precautions:

Do not let product enter drains and surface water

6.2 Methods for cleaning up:

Collect spilled material by aspiration (if it is possible) for reuse or disposal. Keep in well closed containers. Finish cleaning by spreading water on the contaminated surface. Collect spilled material in well closed containers.

Dispose the collect according to local and regional authority requirements (see sect. 13).

7. HANDLING AND STORAGE

7.1 Handling:

Avoid dust formation. When handling apply local exhaust ventilation, in case of insufficient ventilation, use personal protective equipment (see sect. 8).

Avoid skin contact and eye contact. Wear suitable protective clothing.

Smoking, eating and drinking should be prohibited in the application area.

Wash thoroughly after handling.

7.2 Storage:

Keep container tightly closed and away from heat.

Store in a cool, dry and well ventilated place. Avoid heat, humidity and light exposure.

Store separate from basic substances (see sect. 10).

Standard packaging: carton boxes with inner polyethylene bag, plastic big bags with Polyethylene inside.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters:

TLV-TWA: 10 mg/m³ ACGIH (American Conference of Governmental Industrial Hygienists)

8.2 Exposure controls

8.2.1 Appropriate engineering controls:

Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

8.2.2 Individual protection measures

Respiratory protection:

Dust respirator. Be sure to use an approved/certified respirator or equivalent. Follow the OSHA respirator regulations or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hand protection:


Gloves: PVC or Neoprene

Eye/face protection:

Use chemical safety glasses. Maintain eye wash fountain and quick-drench facilities in work area.

Skin protection:

Wear impervious protective clothing, including gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

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9. PHYSICAL AND CHEMICAL PROPERTIES


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| Appearance: | powder |
| Colour: | cream to brownish |
| Odour: | Characteristic |
| Molecular Weight: | 376,42 (g/mol) |
| pH (sol. 19 g/L water): | 2,0 – 3,5 (for pure MNB) |
| Melting point range: | 193 – 198 °C (descomposition – for pure MNB) |
| Water solubility: | 19 g /L (for pure MNB) |

10. STABILITY AND REACTIVITY

- 10.1 Reactivity**
Stable at room temperature in closed containers under normal storage and handling conditions.
- 10.2 Chemical stability**
The product is stable, If handled and stored as recommended. It descomposes at 193-198 °C
- 10.3 Conditions to avoid**
Heat, light and humidity
Dust may form explosive mixture in air.
- 10.4 Incompatible materials**
Avoid Strong acids and strong bases.Strong oxidizing agents

11. TOXICOLOGICAL INFORMATION

- 11.1 Acute toxicity:** LD50 (rat) > 5000 mg/kg
- 11.2 Irritation and corrosion:** Irritating to skin / eyes
- 11.3 Sensitisation** no data available
- 11.4 Carcinogenicity:** classified by IARC in Group 3 "Compounds whose carcinogenic effect on the human being cannot be classified".
- 11.5 Teratogenicity** not teratogenic
- 11.6 STOT-single exposure:** May cause respiratory irritation. Exposure to this product may cause interaction to any personbeing treated with a coagulation inhibitor.
- 11.7 STOT-repeated exposure:** no data available
- 11.8 Aspiration hazard:** no data available

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12. ECOLOGICAL INFORMATION

12.1 Aquatic toxicity

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| Toxicity to fish: | Oncorhynchus mykiss (rainbow trout) LC50 (96 h) 0,43 mg/l (nominal concentration) LC0 0,32 mg/l (nominal concentration) OECD Test Guideline 203 |
| Toxicity to daphnia and other aquatic invertebrates: | Daphnia magna (Water flea) EC50 (48 h) 0,77 mg/l (nominal concentration) OECD Test Guideline 202 |
| Toxicity to algae: | Scenedesmus capricornutum (fresh water algae) ErC50 (72 h) 6,6 mg/l (nominal concentration) OECD Test Guideline 201 |
| Toxicity to bacteria: | Activated sludge (28 d) 74 mg/l No inhibition was observed under the biodegradation test. OECD Test Guideline 301A |

12.2 Persistence and degradability

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| Biodegradability: | Not readily biodegradable. 40 % (28 d) 38 % (7 d) OECD Test Guideline 301A |
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12.3 Other adverse effects


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| Additional ecological information: | An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. |
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13. DISPOSAL CONSIDERATIONS

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| Product: | Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Discharge into the environment must be avoided. Offer surplus and non-recyclable solutions to a licensed disposal company according to regional or national regulations |
| Contaminated packaging: | Dispose of as unused product. Do not re-use empty containers. |
| Untamminated containers: | Untamminated packaging may be taken for recycling |

14. TRANSPORT INFORMATION

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| 14.1 UN Number: | 3077 |
| 14.2 IMDG Description of the goods: | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (menadione nicotinamide bisulfite MNB) |

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Class : 9
Packing group : III
Marine pollutant : Si

IATA

Description of the goods: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
(menadione nicotinamide bisulfite MNB)

Class: 9
Packing group: III
Packing instruction (cargo): 956
Packing instruction (passenger): 956

ADR / RID

Description of the goods: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
(menadione nicotinamide bisulfite MNB)

Class: 9
Packing group: III
Hazard identification No: 90

15. REGULATORY INFORMATION

This SDS has been prepared according to **Dec. 307/2009 - Uruguay (GHS)** and the EC regulation:

CLP - Regulation (EC) No 1272/2008 (GHS): See section 2 and 3

DSD - Classification and labelling according to Directive 67/548/EC:

S-phrase(s):

S22 Do not breathe dust.

S61 Avoid release to the environment. Refer to special instructions/ Safety data sheets.

16. OTHER INFORMATION

16.1 Key or legend to abbreviations and acronyms

GHS: Globally Harmonized System of classification and labelling of chemicals (United Nations)

CLP: Regulation on Classification, Labelling and Packaging of Substances and Mixtures

16.2 Contact a poison control centre (Europe). List of Telephone Number:

AUSTRIA (Vienna Wien) +43 1 40 400 2222; BELGIUM (Brussels) +32 70 245 245; BULGARIA (Sofia) + 359 2 9154 409; CZECH REPUBLIC (Prague) +42 2 2491 9293; DENMARK (Copenhagen) +45 35 31 54 04; FINLAND (Helsinki) +358 9 471 977; FRANCE (Paris) +33 1 40 05 48 48; GERMANY (Berlin) +49 30 450 653565; GREECE (Athens) +30 10 779 3777; HUNGARY (Budapest) +36 80 20 11 99; ICELAND (Reykjavik) +354 543 2222; IRELAND (Dublin) +353 1 8379964; ITALY (Rome) +39 06 305 4343; LITHUANIA (Vilnius) +370 2 36 20 52, +370 2 36 2092; NETHERLANDS (Bilthoven) +31 30 274 88 88; NORWAY (Oslo) +47 22 591300; POLAND (Gdansk) +48 58301 65 16 or +48 58 349 2831; PORTUGAL (Lisbon Lisboa) 808 250 143 (for use only in Portugal), +351 21 330 3284; ROMANIA (Bucharest) +40 21 230 8000; SLOVENIA (Ljubljana) + 386 41 650 500; SPAIN (Barcelona) +34 93 227 98 33 or +34 93 227 54 00 bleep 190; SWEDEN (Stockholm) +46 8 33 12 31 (International) 112 (National); UNITED KINGDOM (London) 0870 243 2241.

16.3 The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated.