INAGROSA
Industrias Agrobiológicas .S.A.
C/Recoletos, 6 3º Izq
28001 Madrid (Spain)
C.I.F: A-120 190 14
TEL: +34914359080
+34914359149
FAX: +34915755467
email: inagrosa@inagrosa.es
web: www.inagrosa.es

SAFETY SHEET – MSDS

KADOSTIM

SECTION 1: IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND THE COMPANY

1.1. Product Identifier.-

Product Name : **KADOSTIM**

Internal Code : BIO 103

Identified appropriate and inappropriate uses for the substance or mixture.-

Use : CE fertiliser. Nutrient-For agricultural use/Biofertiliser

1.2. Information on the supplier of the safety information card/sheet.-

Company : INDUSTRIAS AGROBIOLÓGICAS, S.A. –INAGROSA-
Address : C/ Recoletos, 6. 3º Izq. 28001 MADRID-ESPAÑA

Tel : (+34) 91.435.90.80/91.49
Fax : (+34) 91.575.54.67

E-mail : fichasseguridad@inagrosa.es

1.3. Emergency telephone numbers

INAGROSA	:	(+34)	964.24.00.33
National Institute of Toxicology (24 h)	:	(+ 34)	91.562.04.20
Transport	:	(+ 34)	964.56.50.19

SECTION 2: IDENTIFICATION OF HAZARDS

2.1. Classification of the substance or mixture.-

Not classified according to EU legislation. The product is not hazardous.

2.2. Information shown on the label.-

Information on the label: (EC) Regulation Nº 1272/2008

Safety advice/warning:
P102 Keep out of the reach of children
P401 Keep/Store away from food, drink and fodder

2.3. Other hazards.-

None known

SECTION 3: COMPOSITION/INFORMATION ABOUT THE COMPONENTS

3.1. Substance.-

Amino acids and oligopeptides (peptides of 3, 4 and 5 amino acids) mixed in aqueous solution.

Name	CAS Nº	EINECS Nº	Other definitions
Amino acids and peptides	9015-54-7	310-295-0	Chemically modified natural polymer
Water	7732-18-5	231-791-2	

Hazardous impurities: None

Does not contain hazardous components according to the OSHA-USA definitions, it complies with OSHA29CRF

3.2. Mixtures.-

Amino acids and oligopeptides (Nº CAS 9015-54-7; Nº CE 310-295-0) + water + K

Hazardous impurities: None

SECTION 4: FIRST AID

4.1. Description of first aid.-

General recommendations: Although there are no foreseeable hazardous effects during the normal use of the substance or the mixture, certain instructions must be followed; for this purpose, in case of poisoning, always have the container, the label or the safety sheet at hand when contacting the Inagrosa emergency number, the National Institute of Toxicology, or when consulting a doctor.

Inhalation: Take the person affected to a ventilated cool space and notify a doctor. Monitor their breathing. Should there be irregular breathing or respiratory arrest, administer artificial respiration. Contact a doctor or a toxicology information centre immediately.

Contact with the eyes: Wash the eyes thoroughly with plenty of water for at least 15 minutes keeping the eyelids wide open to ensure an adequate rinse and contact a doctor.

Ingestion: Rinse the mouth with plenty of water and contact a doctor. Do not administer anything orally if the patient is unconscious.

Contact with the skin: Wash the skin immediately with plenty of water.

Ingestion: Rinse the mouth with plenty of water and contact a doctor. Do not administer anything orally if the patient is unconscious.

Contact with the skin: Wash the skin immediately with plenty of water.

UNDER NO CIRCUMSTANCES CAN THE PERSON AFFECTED BE LEFT UNATTENDED AND, IF DUE TO THE ALLERGIC CONDITION OF THE PATIENT THE POISONING IS SEVERE, PLEASE CONTACT THE NATIONAL INSTITUTE OF TOXICOLOGY ON Tel 91 562 04 20

4.2. Main symptoms including acute and delayed effects. –

No symptoms or acute delayed effects have been either identified or observed.

4.3. Instructions on all medical attention and special treatments that must be provided immediately.-

There is none to highlight. Deal with the symptoms.

SECTION 5: FIRE FIGHTING MEASURES

5.1. Means of extinguishing fires.-

Appropriate means of extinguishing fires: in the first instance, take notice of any available materials (water, etc.) in the surroundings. In case of fire it is recommended to use dry dust, carbon dioxide, water or foam.

Inappropriate means for extinguishing fires: None known.

5.2. Specific hazards arising from the substance or mixture.-

In the case of combustion, the product may emit itching and suffocating fumes or, if it has been mixed with other chemical compounds, toxic and corrosive fumes.

5.3. Recommendations for firefighting personnel.-

The product itself is not flammable. The fire extinguishing measures must be coordinated taking into account local and environmental circumstances; use self-contained breathing apparatus and protection for the face and eyes.

5.4. Other information.-

Do not allow the water from fire extinguishing processes to enter the sewage system or reach surface waters.

SECTION 6: MEASURES IN CASES OF ACCIDENTAL SPILLAGE

6.1. Personal precautions, protection equipment and emergency procedures.-

Comply with the health and safety policy of the centre, as well as with the safety recommendations, using protective gloves, safety glasses, appropriate clothing and good hygiene practices. Avoid the formation of inhalable spray and dust.

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6.1.1. For personnel who are not part of the emergency services:

Avoid all contact with the skin. Wear protective gloves, glasses or a facial screen, adequate protective clothing as described in section 8:"Individual Exposure/Protection Controls". Keep away from ignition sources. Evacuate the hazardous area or consult an expert.

6.1.2. For emergency personnel:

Wear protective gloves (nitrile), safety glasses or a facial screen, adequate protective clothing as described in section 8:" Individual Exposure/Protection Controls". Keep away from ignition sources. Evacuate the hazardous area or consult an expert.

6.2. Environmental precautions:

Recover the product to be re-used. Notify the authorities if the product was spilt into a water course or sewer, or has fallen on the ground or vegetation.

6.3. Cleaning containment methods and material:

Wash with water.

6.4. Reference to other sections:

For personal protection see section 8.

SECTION 7: HANDLING AND STORAGE

Personal protection measures:	Comply with all safety recommendations and practices according to the best personal industrial hygiene and working practices by using the appropriate protective gloves, glasses and clothing. There are no specific recommendations if the product is used correctly.
Precautionary firefighting measures:	See Section 5. There are no additional precautionary measures.
Preventative measures in the generation of sprays and dust:	During manufacture: use the product according to the best manufacturing practices.
Environmental protection measures:	Always follow the recommended precautions and procedures when using the product.
General work hygiene recommendations:	Do not smoke, drink or eat in working areas, wash your hands after using the product; clear away all protective clothing and equipment before entering the eating areas.

7.2. Safe storage conditions, including any possible incompatibilities.-

Store in a cool, dry and well ventilated space. Store the product only in their original containers. Keep out of the reach of children and animals.

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7.3. Specific end uses.-

The only product application is as a fertiliser (read product label).

SECTION 8: INDIVIDUAL EXPOSURE/PROTECTION CONTROLS

8.1. Control parameters.-

No Environmental Limit Values have been set for any of the components of the product.

No Biological Limit Values have been set for any of the components of the product.

Carcinogenicity: no ingredient listed by IARC, ACGIH, NTP or OSHA has been listed as carcinogenic.

8.2. Exposure controls.-

Engineering regulations:

Any premises where the product is being stored or used must be adequately ventilated, cool and dry.

When the product is being used in powder form it is recommended to do so in a space with forced ventilation system.

Comply reasonably with all safety recommendations and practices according to the best personal and occupational hygiene practices by using adequate protective safety gloves, glasses and clothing that completely protects the skin.

8.2.1. Appropriate technical controls:

Use the appropriate ventilation procedures at each step of the process where emissions of vapour or gasses may occur. Ventilate all transport vehicles prior to unloading them.

8.2.2. Individual protection measures, such as personal protection equipment:

Airways: All usual precautions in the handling of chemical products must be observed.

Hands: Wear protective gloves.

Eyes: It is advisable to wear approved chemical protection glasses or a facial screen.

Skin and body: Wear adequate protective clothing.

8.2.3. Control of environmental exposure:

Avoid any possible spillages reaching surface waters or sewers.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on the basic physical and chemical properties.-

BOILING POINT:	115 ºC	FREEZING POINT:	-20 ºC	SPECIFIC GRAVITY:	1.12

VAPOUR PRESSURE: <0.005 m Pa (25ºC)

(H_2O = 1) VAPOUR DENSITY: *NE

(Air= 1) WATER % wt. *NE APPEARANCE AND ODOUR: amber, slight amine-like odour

SOLUBILITY IN WATER AND ORGANIC SOLVENTS:

Minimum: Tyrosine 0.04 g/100 ml H_2O (25 ºC); Maximum: Lysine, Threonine and Proline: 190-180-162- g/100 ml (25 ºC)

EVAPORATION INDEX: *NE

pH 6.00-7.00

COEFFICIENT OF SEPARATION FROM WATER AND ORGANIC SOLVENTS: (N-octanol): Log Kow = -2.9; -2.1 (25 ºC)

DISSOCIATION CONSTANT: PKa (α-COOH) Min. 1.8 (Histidine); PKa (α- NH_3+) Max. 10.8 (cysteine)

NE: No evidence

Physical state:	Liquid
Form:	Liquid
Colour:	Dark brown
Odour:	Characteristic of amines
Odour threshold:	Not determined
pH in 10% solution w/w:	7 to 8
Dry substance:	11.90%
Melting point/range:	Not determined
Freezing point:	-20 ºC
Boiling point/range:	115ºC
Flash point:	Not determined
Evaporation rate:	<0.005 m Pa (25ºC)
Combustibility (solid/gas)	Not determined
Lower explosive limit:	It has not been possible to determine in experiments
Upper explosive limit:	It has not been possible to determine in experiments
Vapour pressure:	<0.005 m Pa (25º C)
Vapour density:	No available data
Density:	1.12
Water solubility (20ºC in g/100 ml):	145 (Minimum Tyrosine 0.04, Maximum Lysine 190 g/100 ml)
N-octanol/water partition coefficient:	Log Kow= -2.9; 2.1 (25ºC)
Self-ignition temperature:	Not flammable according to the experiments
Thermal decomposition:	From 240 ºC
Dynamic viscosity:	52 cP (centipoise)
Kinematic viscosity:	Kinematic/dynamic viscosity= 44.82 CST (centistokes) = 0.00004482 m^2/s
Explosive properties:	None
Comburent properties:	None

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9.2. Other information.-

(ANALYSIS)

METHOD	PARAMETER	RESULT	UNITS
EPA 160.4	Total solids	9.95	%
AOAC 978.02	Total Nitrogen (N)	5.00	%
AOAC 920.03	Ammoniacal Nitrogen (N)	1.60	%
AOAC958.01	Phosphorus (P)	0.10	%
	Potassium (K)	6.00	%
ATOMIC Absorption	Iron	4.00	mg/Kg
	Magnesium (Mg)	<2.7	mg/Kg
	Sodium (Na)	15	mg/L
	Chlorides	<0.15	%

Radioactive Carbon C-14 1-1-2006; laboratory tests USDA approved: complies with USDA regulation for the tested product at 90.

Clean air dilution: VOC is 1.0 g/L meets CAS criteria.

HPLC-FMOC: Perkin Elmer Chromatograph

Glycine:	800 mg/l	Valine:	40 mg/l
Proline:	350 "	Hydroxiproline:	350 "
Alanine:	350 "	Aspartic Acid:	680 "
Arginine:	30 "	Glutamic Acid:	225 "
Lysine:	345 "	Leucine:	50 "
Isoleucine:	125 "	Phenylalanine:	145 "
Methionine:	25 "	Serine:	140 "

Process: Cell pathway biosynthesis

L-amino acids: 100% Purity > 99.999%

Toxicity: Not toxic. Intravenous toxicity DL_{50} > 4.000 mg/Kg

HEAVY METALS:

As	less than	0.005 ppm	Cd	less than	0.008 ppm
Co	"	0.125 ppm	Hg	"	0.002 ppm
Ni	"	0.065 ppm	Pb	"	0.202 ppm
Cr	"	0.417 ppm			

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity.-

Stable under the recommended conditions of storage and handling in their closed original container (see section 7).

10.2. Chemical stability.-

Stable for a minimum of 4 years under the recommended conditions of storage and handling in their closed original container (see section 7).

10.3. Possibility of hazardous reactions.-

None known.

10.4. Conditions that must be avoided.-

Avoid thermic shocks because of the possibility of causing crystallisation.
Avoid storage at temperatures >30 ºC and <2 ºC because of the difficulty in handling the product due to an increase in viscosity.
With time (>2 years), there is a slight change in the colour and odour, which do not negatively affect the quality of the product.

10.5. Incompatible reactions.-

Strong oxidising agents, due to the possibility of producing exothermic reactions.

10.6. Hazardous decomposition products.-

None under the normal storage conditions.

SECCIÓN 11: TOXICOLOGY INFORMATION

11.1. Information on toxicological effects.-

The product is neither dangerous, toxic, nor harmful if taken by mouth or through the skin, nor irritant to the eyes or the skin, therefore it does not have toxicological effects.

The substance (active material) was developed for medicinal use hence full toxicological tests were carried out, some of which are summarised below:

In plants: ***(1986-1988)*** Professor Huffacker of the University of California at Davies (UCD) tested AMINOL-FORTE, containing "FACE" as the "substance" or active material, on wheat plants using doses 1000 times greater than those recommended (0.1%), and no toxic or physiologically harmful effects were observed.

In animals: ***(1990-1991)*** the organisation Life Science Research Ltd (UK) carried out toxicology tests with "FACE" under code "UCL-87" on rats and beagles. No effects were observed. The oral administration to CD rats and beagles, at a rate of 2500 mg/Kg/day and 4000 mg/Kg/day, showed no evidence of toxicity.

(1992) BIOGIR S.A.-Bordeaux (France) on guinea pigs (Magnusson and Kligman test), ACL-28 ("FACE" code) was considered hypoallergenic.

In rabbits, the skin tolerance tests showed that it did not cause irritability to the skin.

(1991) Research at the Ramon y Cajal hospital (Madrid), endocrinology department, and in the "Carlos III" National Health Institute also in Madrid, the team of Doctor Sanchez-Franco tested "FACE" as part of an investigation on degenerative diseases of the central nervous system by injecting Wilstar rats intra-muscularly with the equivalent of 1cc/Kg/week. No toxic effects were observed either on the hematoencephalic barrier when it was crossed, or on the brain cells. On the contrary, an increase in the release of neuropeptides and neurotransmittors was observed which were of a positive therapeutic nature.

In humans*:** ***(1992) FACE was tested by BIOGIR S.A. in Bordeaux (France) under the ALEC-28 code and in ointment form for dermatological applications. In the skin tolerance test on 45 patients with allergic pathologies, FACE did not show any primary skin irritability effects nor did it have irritability effects in the eyes.

In cells: ***(1988-1990)*** in primary cerebral cortex neuroblasts cultures, FACE did not show any toxicological effect. On the contrary, several positive neurotropic effects were observed and measured. Spain: in Madrid, Ramon y Cajal hospital, neuro-physiology department, and in the National Health Institute also in Madrid.
(1990) CONTOX S.A., Madrid: "Tests on the cellular transformation (neoplasia) in eukaryotic cell cultures (BHK-21-C13)": the short chain peptides and free amino acids core sample (FACE) submitted by INAGROSA under reference 1201 CT-IC to that laboratory did not show a genotoxic nature in the cellular transformation test (neoplastic cell formation in vitro). March 1990.

CONCLUSION:

Toxicological tests on the active matter FACE, the basis of the bio-stimulant properties of the range of INAGROSA products (NATURCARE, AMINOL-FORTE, FORNUTREN, KADOSTIM and HUMIFORTE), manufactured using the said active material, and that are also referred to with identification codes ULC-87, NOMAR-200 and ALEC-28 showed that:

In vitro: No damage, toxicity or genotoxicity were observed.

In vivo: No toxic effects were observed in oral, intramuscular, intravenous or subcutaneous administration tests on mice, rats, beagles, carried out under international regulations and standardisation protocols for toxicity tests. Therefore the product has been classified as having "no or very low toxicity".

Doses of up to 4000 mg/Kg administered by mouth did not show any effect on organs such as the brain, liver, spleen, etc., and no animal died. Calculations of DL50 oral or intravenous acute toxicity in mice and rats were above 2000 mg/Kg. No real amount of DL50 was ascertained given that no death occurred during the tests.

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SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity.-

Environmental effects: this product has positive effects on the environment. It is a beneficial product. When the product is released into the soil, the agro-biological activity of the microflora increases, as does the fertility of the soil. This product has a very low duration in the soil.

- Environmental toxicity: none known.
- Water toxicity: no negative effect has been observed. LC50>3000mg/L. Rostov Institute. Ex USSR.1990.
- Chronic toxicity in fish, fish eggs, young fish, and sturgeon larvae Daphnia Magna: no negative effects have been observed. LDO>2344 MG/L LD100>3000 MG/L (Rostov Institute. 1990).
- Chemical content: it contains no Class I or Class II substances that may damage the Ozone layer, defined by 40CFR82 equal to or greater than 1% Wt.
- Eco-toxicology (Summary. For further information request the complete study from the manufacturer):

  DL50 quail > 3.000 mg/kg (no deaths). Not in any way toxic.

  CL50 trout/salmon > 3.000 mg/kg (no deaths). "

  DL 50 bees > 1.000 mg/bee (no deaths). "

12.2. Persistence and degradability.-

The product is biodegradable in aerobic conditions. The amino acid and peptide components deriving from natural proteins are metabolised immediately by living beings present in the environment. The biotic degradation produces more simple metabolites, which are involved in the biochemical processes of live cells and therefore the product is completely biodegradable.

12.3. Bio-accumulation potential.-

Since the substance contains free amino acids and oligopeptides obtained by cellular biosynthesis and not by the hydrolysation of proteins, they are metabolised very quickly by the microflora and the fauna. They remain in the environment for a very short period showing no tendency to the bioaccumulation.

The NPK contents, in relative small percentages are transported by amino acids and do not accumulate in the soil.

12.4. Mobility in the soil.-

The mobility of the product in the soil is very high since it contains free amino acids and oligopeptides obtained by cellular biosynthesis and not by protein hydrolysis, thus being absorbed very quickly and metabolised by microorganisms in the soil.

According to experiments carried out using rigorous methodology, it is due to this fact that even if the product is dumped on the soil in large quantities, it does not contaminate either the surface water or the water table.

The NPK contents, in relatively small percentages, are transported by the amino acids and do not accumulate in the soil.

12.5. Result of the PBT and mPmB evaluation.-

Not applicable

12.6. Other adverse effects.-

No other adverse effects to the environment are known.

SECTION 13: CONSIDERATIONS IN RELATION TO DISPOSAL

13.1. Methods for the treatment of waste

Do not contaminate the water, fodder, food or seeds during the disposal of the waste. The open dumping and burning of this product in their containers is strictly forbidden.

Given that the acceptable disposal methods and legal requirements may vary in different countries, the relevant official authorities must be contacted prior to the disposal.

In the case of spillage see section 6.

Do not dump in residual waters

Container Management:

Rinse each used container thoroughly three times, pouring the rinsing water into the sprayer tank. The empty container is a hazardous residue, which the user is therefore obliged to take it to the reception point of the integrated management system SIGFITO.

European/Spanish directives relating to this section on the disposal of waste:

2001/573 EC, Decision issued by the Council dated 23 July 2001, which modifies Directive 75/442 EC relating to waste.
Directive 94/62/EC issued by the European Parliament and the Council dated 20 December 1994, relating to packaging and packaging waste.

In Spain:
11/1997 Act dated 24 April, approving the regulation for the development and implementation of the 11/1997 Act on Packaging and packaging waste. Published in BOE 01/05/1998

MO issued by MAM7304/2002 dated 08 February by which the evaluation and disposal of waste operations and the European waste list were circulated. Published in BOE 19/02/2002

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SECTION 14: INFORMATION RELATING TO TRANSPORT

Transport by road (ADR/RID) Non-hazardous goods

14.1. UN number: not applicable
14.2. United Nations official transport designation: not applicable
14.3. Transport hazard class (es): not applicable
14.4. Packaging group: Group III
14.5. Environmental hazards: not applicable

Transport by water on vessel (IMDG) Non-hazardous goods

14.1. UN number: not applicable
14.2. United Nations official transport designation: not applicable
14.3. Transport hazard class (es): not applicable
14.4. Packaging group: Group III
14.5. Environmental hazards: not applicable

Transport by air (IATA-DGR) Non-hazardous goods

14.1. UN number: not applicable
14.2. United Nations official transport designation: not applicable
14.3. Transport hazard class (es): not applicable
14.4. Packaging group: Group III

14.6. Special precautions for users.-

None

14.7. Transport in bulk in accordance with Appendix II of the MARPOL Agreement 73/78 and the IBC Code

Not applicable

SECTION 15: REGULATORY INFORMATION

15.1. Regulation and legislation in matters of health, safety and the environment specific for the substance or mixture.-

The substance is not subject to any specific European prescriptions in relation to the protection of health and the environment.

15.2. Evaluation of the chemical safety.-

A chemical safety report has been carried out.

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SECTION 16: OTHER INFORMATION

Methods for the evaluation of the information referred to in article 9 of the Regulation (EC) Nº 1272/2008 used for classification purposes:

16.1. Other information

Classification based on studies and tests on the active substance.

Full forms of abbreviations

ADR:	**European Agreement Concerning the International Carriage of Dangerous Goods by Road**
IMDG:	**International Maritime Code for Dangerous Goods.**
CL50:	**Lethal Concentration, 50%**
CE50:	**Effective Dose, 50%**
RID:	**Regulations concerning the International Carriage of Dangerous Goods by Rail.**
IATA-DGR:	**International Air Transport Association-Dangerous Goods Regulation.**
GHS:	**Globally Harmonised System of Classification and Labelling of Chemicals**
OSHA:	**Occupancy Security& Health Agency-USA**
FRC:	**Federal Regulation Code-USA**
PEL:	**Permissible Exposure Limit**
WHMIS:	**Hazardous Materials Information System**
CAS:	**Chemical Abstract Service**
VOC:	**Volatile Organic Cleaner**
STEL:	**Short Term Exposure Limit**
TWA:	**Time Weighted Average**
TLV:	**Threshold Limit Value**
NTP:	**National Toxicology Programme-USA**

The information provided in the Safety Information Sheet is the most up-to-date at the time of its publication. The information given is intended only as a safety guide in the handling, use, processing, storing, transport, disposal and release of the product it describes and it must not be considered as a quality guarantee or specification. The information refers only to the specified material and may not be valid for the said material when used in conjunction either with any other substances or processes, unless indicated in the text.

Changes since the last version have been highlighted at the margin if they refer to important safety information, otherwise they are not highlighted. This version nº 3 replaces all other previous versions.