

**SAFETY DATA SHEET****Tri Zinc diCitrate**

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Complying with 1907/2006/EEC Regulation of 18 December 2006 ("REACH Regulation") and REGULATION (EC) No 1272/2008 (CLP)

**Section 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING****1.1 Product identifier**

**Product name:** Tri zinc dicitrate

**Chemical name (e.g. IUPAC name):** Citric acid zinc salt

**Synonyms:** Tri zinc citrate; Citric acid zinc salt

**Trade Name:** N/A

**Chemical formula:** C<sub>6</sub>H<sub>8</sub>O<sub>7</sub>.3/2Zn

**Product type:** Powder

**CAS number:** 5990-32-9

**EC number:** 208-901-2

**REACH registration no(s):** 01-2119461715-35-0001

**1.2 Relevant identified uses of the substance or mixture and uses advised against**

**Use of the substance/preparation:**

In toothpaste and mouthwash.

Fortification of food stuff with Zinc.

**1.3 Details of the supplier of the safety data sheet**

**Company/undertaking identification**

**Supplier/Manufacturer:** Gadot Biochemical Industries Ltd

117 Hahistadrut Ave

P.O.B 10636

Haifa Bay 26118

Israel

Tel: +972-4-8461555

Fax: +972-4-8461560

**E-mail address of person responsible for this SDS:**

Nissim Guigui - R&D and Quality Manager

nissim@gadotbio.com

**1.4 Emergency telephone number**

**Emergency telephone number (24 hours a day every day including weekends and holydays):**

+972-4-8461555

**Section 2. HAZARDS IDENTIFICATION****2.1 Classification of the substance or mixture**

**Classification in accordance to Regulation(EC) No. 1272/2008 (CLP/GHS)**

<b>Product name</b>	<b>GHS Classification</b>
Tri zinc dicitrate	Aquatic Acute 1; H400

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**Classification according to Directive 67/548/EEC (DSD) or 1999/45/EC**

<b>Product name</b>	<b>EU Classification</b>
Tri zinc dicitrate	It is proposed that trizinc dicitrate should not be classified in the EU for the environment as Acute Category 1.

**2.2 Label elements**

Labeling in accordance with Regulation 1272/2008 (CLP)

Hazard pictograms:



Signal word: Warning

Hazard statements: Very toxic to aquatic life

**Precautionary Statements:**

P273, P391, P501: Avoid release to the environment. Collect spillage. Dispose of container to a licensed disposal company.

**2.3 Other hazard**

Substance meets the criteria for BBT according to Regulation (EC) No. 1907/2006, Annex XIII:

Not applicable

Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII:

Not applicable

Other hazard which do not result in classification:

Not applicable

**Section 3. COMPOSITION/INFORMATION ON INGREDIENTS****Substance/preparation:**

<b>Product/ Ingredient name</b>	<b>Identifiers</b>	<b>%</b>	<b>EU Classification</b>	<b>GHS Classification</b>
Tri zinc dicitrate	CAS number: 546-46-3 EC number: 208-901-2 REACH registration no(s): 01-2119461715-35-0001	100%	-	Aquatic Acute 1; H400

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in section 8.

See section 16 for the full text of the H- statements and R-phrases declared above.



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**Section 4. FIRST AID MEASURES**

**4.1 Description of first aid measures**

**Eyes contact:** Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately if irritation develops or persists or if visual changes occur.

**Skin contact:** In case of contact, immediately wash with soap and plenty of water. Get medical attention if irritation develops or persists. Remove contaminated clothing and shoes. Clean contaminated clothing and shoes before re-use.

**Inhalation:** If respiratory irritation or distress occurs, remove victim to fresh air. Get medical attention if respiratory irritation or distress continues.

**Ingestion:** If victim conscious and alert, give water to drink. DO NOT INDUCE VOMITING. Do not give anything by mouth to an unconscious person. Get medical attention.

**4.2 Most important symptoms and effects, both acute and delayed**

**Potential acute health effects**

Inhalation: There is no direct information regarding respiratory tract information

Ingestion: May be harmful by ingestion.

Skin contact: Not irritating. No studies indicated trizinc dicitrate as corrosive to skin.

Eyes contact: Not irritating. No studies indicated trizinc dicitrate as corrosive to eye.

**Over-exposure sign/symptoms:**

Toxic to mucous membranes.

**4.3 Indication of any immediate medical attention and special treatment needed**

**Notes to physician:** No specific antidote, medical staff contacts Poisons Information Center. All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

**Special treatments:** No specific treatment

**Section 5: Fire-Fighting Measures**

**5.1 Extinguishing media**

Suitable: Water spray, foam, dry chemical or carbon dioxide.

Not suitable: N/A

**5.2 Special hazards arising from the substance or mixture**

Under fire emits zinc, zinc oxides and irritating and toxic fumes.



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#### **5.3 Advice for firefighters**

**Special protective equipment for fire fighters:** Fire fighters should wear full protective clothing and self-contained breathing apparatus in positive pressure mode.

**Remark:** Move containers from fire area if possible to do so without risk.

#### **Section 6: Accidental Release Measures**

##### **6.1 Personal precautions, protective equipment and emergency procedures**

Wear protective clothing. Avoid contact with skin eyes and inhalation of dust. Remove all sources of ignition. Ventilate area of spill. Avoid dust formation.

##### **6.2 Environmental precautions**

Prevent entry into waterways, sewers, basements or confined areas.

##### **6.3 Methods and materials for containment and cleaning up**

**Small spill:** Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

**Large spill:** As for small spill.

**Personal Protection in Case of Large Spill:** Safety glasses. Full suit. Suitable respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product.

##### **6.4 Reference to other sections**

See Sections 1 for emergency contact information

See Section 8 for information on a appropriate personal protective equipment

See Section 13 for additional waste treatment information

#### **Section 7: Handling and Storage**

##### **7.1 Precautions for safe handling**

**Handling:** Avoid contact with eyes, skin and clothing. Do not permit eating/drinking/smoking near the material. Keep away from heat, sparks and open flame. Avoid raising dust.

**Hygiene Measures:** Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also section 8 for additional information measures.

##### **7.2 Conditions for safe storage, including any incompatibilities**

**Storage:** Keep containers tightly closed, in dry, cool and well-ventilated place. Do not store together with strong oxidizing agents.

**7.3 Specific end use(s):** N/A

#### **Section 8: Exposure Control / Personal Protection**

##### **8.1 Control parameters**

**Occupational exposure limit values:** N/A

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**Derived effects levels:**

Recommended occupational and consumer exposure limit values (following from the preformed CSA):

Exposure pattern	Derived No Effect Level (DNEL)	
	Workers	General population
Oral	N/A	N/A
Dermal	0.535 mg Zn <sup>2+</sup> /kg bw/day 2.83 mg Zn <sup>2+</sup> /kg bw/day 0.136 mg Zn <sup>2+</sup> /kg bw/day	N/A
Inhalation	1.89 mg Zn <sup>2+</sup> /m <sup>3</sup> 9.96 mg Zn <sup>2+</sup> /m <sup>3</sup> 0.96 mg Zn <sup>2+</sup> /m <sup>3</sup>	N/A

**8.2 Exposure controls****Engineering Measures**

Use process enclosures, local exhaust ventilation, or others engineering controls to keep airborne levels below recommend exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Person Protective measures****Occupational exposure controls:**

Respiratory protection: Suitable respirator. Be sure to use an approved/certified or equivalent. Wear appropriate respirator when ventilation is inadequate.

Eye protection: Wear protective safety goggles.

Skin protection:

Hand protection: Chemically compatible gloves.

Other: Wear appropriate long-sleeved clothing to minimize skin contact.

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice.

**Environmental exposure controls:** Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

**Section 9: Physical and Chemical Properties****9.1 Information on basic physical and chemical properties**

Appearance: Powder, white

Odour: N/A

Odour threshold: N/A

pH: Neutral

Melting point/Freezing point: 295°C

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Initial boiling point/boiling range: Decomposes without boiling  
Flash point: Not relevant  
Evaporation rate: N/A (butyl acetate=1)  
Flammability: Non flammable  
Upper/lower flammability or explosive limits: N/A  
Vapor pressure: Negligible  
Vapor density: N/A  
Relative Density: 1.7-2.0 at 20°C  
Solubility(ies): Water solubility- 3 g/l at 20°C  
Partition coefficient Octanol/Water: Log Kow: -0.2 to -1.8 (Citric acid)  
Auto-ignition temperature: Not relevant  
Decomposition temperature: N/A  
Viscosity: N/A  
Explosive properties: Not explosive  
Oxidizing properties: N/A

**9.2 Other information:**

Molecular weight: 574

**Section 10: Stability and Reactivity****10.1 Reactivity**

No specific test data related to reactivity available for this product or its ingredients.

**10.2 Chemical stability**

The product is stable under normal handling and storage conditions described in Section 7.

**10.3 Possibility of hazardous reactions**

Hazard polymerization: N/A

**10.4 Conditions to avoid**

Keep away from heat, sparks and open flame.

**10.5 Incompatible materials**

Strong oxidizing agents.

**10.6 Hazardous Decomposition products:**

Under fire- zinc, zinc oxides and irritating and toxic fumes.

**Section 11: Toxicological Information****11.1 Information on toxicological effects****Acute toxicity:**

<b>Product/ingredient name</b>	<b>Test</b>	<b>Species</b>	<b>Dose</b>
Tri zinc dicitrate	LD50, Oral	Rat	>2000 mg/kg
	LD50, Dermal	Rat	>2000 mg/kg
	LD50, Dermal	Rabbit	>2000 mg/kg



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**Irritation and corrosivity:**

Inhalation: There is no direct information regarding respiratory tract information

Ingestion: May be harmful by ingestion.

Skin contact: Not irritating. No studies indicated trizinc dicitrate as corrosive to skin.

Eyes contact: Not irritating. No studies indicated trizinc dicitrate as corrosive to eye.

**Sensitization:** Not sensitizing

**Chronic toxicity:**

Carcinogenicity: There is no evidence to suggest that the substance should be classified for this endpoint.

Mutagenicity : The available data, obtained by read-across from citric acid and sodium dihydrogen citrate, is sufficient to fulfill the information requirements for this endpoint. Information on the genetic toxicity of zinc indicates that the zinc ions are not expected to contribute to genetic toxicity. No further testing is considered necessary. Additionally, the exposure of trizinc dicitrate is not expected to differ significantly from the effects of adding zinc ions and citric acid separately in a solution, so exposure to the test organisms can be considered as exposure to the citrate and the metal ions separately. Therefore, it is possible to read across from one citrate salt to another and conduct the hazard assessment for this substance, trizinc dicitrate, on the properties of citric acid and sodium dihydrogen citrate. *In vivo* studies on citric acid showed no effects, so it is concluded that classification for mutagenicity is not required.

Reproductive toxicity: The effect of trizinc dicitrate is not expected to differ significantly from the effects of the zinc ions and citric acid separately once absorbed. Since the known toxicological effects of citric acid are negligible, the toxicological effects of trizinc dicitrate are therefore derived from the zinc cation.

Based on the reported toxicological test data for zinc, it can be concluded that it is unlikely that trizinc dicitrate would impair fertility.

Specific target organ toxicity (single exposure): N/A

Specific target organ toxicity (repeated exposure): N/A

Aspiration hazard: N/A

**Other effects**

Over exposure signs/symptoms: Toxic to mucous membranes.



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**Section 12: Ecological Information**

**12.1 Toxicity**

Substance name	Toxicity to fish	Toxicity to crustaceans	Toxicity to algae	Toxicity to other aquatic plants	Other toxicity data (birds, bees, plants etc.)
Tri zinc dicitrate	LC50/96h (Fish) 0.136 mg/l	LC50 (24h): 1535 mg/l	NOEC (8d): 425 mg/l	-	-
	LC50 (48h): 440/760 mg/l	EC50(48h): 0.068 mg/l	NOEC (72h): 0.005 mg/l		

**12.2 Persistence and Degradability**

Readily biodegradable

**12.3 Bioaccumulative potential**

N/A

**12.4 Mobility in soil**

Soil/water partition coefficient (Koc) : N/A

**12.5 Results of PBT and vPvB assessment**

The substance does not meet the criteria for PBT or vPvB.

**12.6 Other adverse effects**

Substances which have an unfavorable influence on the oxygen balance and can be measured using parameters such as BOD, COD, etc.: N/A

Substances, which contribute to eutrophication: N/A

**Section 13: Disposal Considerations**

**13.1 Waste treatment methods**

**Methods of disposal:** Waste must be disposed of in accordance with federal, state and local environmental control regulations.

**Hazardous waste:** N/A



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**Section 14: Transport Information****International transport regulations**

<b>Regulatory Information</b>	<b>14.1 UN number</b>	<b>14.2 Proper shipping name</b>	<b>14.3 Transport hazard class(es)</b>	<b>14.4 Packing group</b>	<b>14.5 Environmental hazard</b>	<b>14.6 Special precautions for user</b>	<b>Additional information</b>
ADR/RID Class	Not regulated	-	-	-	-	-	-
IMDG class	Not regulated	-	-	-	-	-	-
IATA class	Not regulated	-	-	-	-	-	-

**14.7 Transport to bulk according to Annex II of MARPOL 79/78 and the IBC Code**

Not applicable

**Section 15: Regulatory Information****15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

EU Directives 67/548/EEC and 1999/45/EC (including amendments) and take into account the intended product use

EU Regulation(EC) No.1907/2006 (REACH), No 1272/2008 (CLP)

**15.2 Chemical safety assessment**

In accordance with REACH article 14, a Chemical Safety Assessment has been carried out for this substance.

**Section 16: Other Information****Full text of R-phrases referred to in sections 2 and 3:**

It is proposed that trizinc dicitrate should not be classified in the EU for the environment as Acute Category 1.

**Safety phrases:**

It is proposed that trizinc dicitrate should not be classified in the EU for the environment as Acute Category 1

**Full text of Hazards Statements referred to in sections 2 and 3:**

H400: very toxic to aquatic life

**Precautionary Statements:**

P273, P391, P501: Avoid release to the environment. Collect spillage. Dispose of container to a licensed disposal company.

**Training advice:** Before using/handling the product one must read carefully present MSDS.**Recommended restriction:** N/A



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Key Legend Information:

ACGIH- American Conference of Governmental Industrial Hygienists

OSHA- Occupational Safety and Health Administration

NTP- National Toxicology program

IARC- International Agency for Research on Cancer

ND- Not Determined

N/A- Not available

R-phrases- Risk phrases

S-phrases- Safety phrases

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