SAFETY DATA SHEET

Multivitamin (with Soy Oil) Formulation

Version 1.4
Revision Date: 10.10.2020
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SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Multivitamin (with Soy Oil) Formulation

Manufacturer or supplier’s details
Company: MSD
Address: 91-105 Harpin Street
         Bendigo, 3550, Victoria Australia
Telephone: 908-740-4000
Emergency telephone number: 1 800 033 461
E-mail address: EHSDATASTEWARD@msd.com
Telefax: 1 800 817 414

Recommended use of the chemical and restrictions on use
Recommended use: Veterinary product

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification
Not a hazardous substance or mixture.

GHS label elements
Not a hazardous substance or mixture.

Other hazards which do not result in classification
None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture: Mixture

Components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(dl)-a-Tocopheryl acetate</td>
<td>7695-91-2</td>
<td>&lt; 10</td>
</tr>
<tr>
<td>Vitamin A Palmitate</td>
<td>79-81-2</td>
<td>&lt; 0.3</td>
</tr>
<tr>
<td>Colecalciferol</td>
<td>67-97-0</td>
<td>&lt; 0.3</td>
</tr>
</tbody>
</table>

SECTION 4. FIRST AID MEASURES

If inhaled: If inhaled, remove to fresh air. Get medical attention if symptoms occur.

In case of skin contact: Wash with water and soap as a precaution. Get medical attention if symptoms occur.

In case of eye contact: Flush eyes with water as a precaution. Get medical attention if irritation develops and persists.
If swallowed: If swallowed, DO NOT induce vomiting. Get medical attention if symptoms occur. Rinse mouth thoroughly with water.

Most important symptoms and effects, both acute and delayed: None known.

Protection of first-aiders: No special precautions are necessary for first aid responders.

Notes to physician: Treat symptomatically and supportively.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water spray
                        Alcohol-resistant foam
                        Carbon dioxide (CO2)
                        Dry chemical

Unsuitable extinguishing media: None known.

Specific hazards during firefighting: Exposure to combustion products may be a hazard to health.

Hazardous combustion products: Carbon oxides

Specific extinguishing methods: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.

Special protective equipment for firefighters: Wear self-contained breathing apparatus for firefighting if necessary. Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).

Environmental precautions: Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g. by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up: Soak up with inert absorbent material. For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container. Clean up remaining materials from spill with suitable absorbent. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to deter-
mine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

SECTION 7. HANDLING AND STORAGE

Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
Local/Total ventilation : Use only with adequate ventilation.
Advice on safe handling : Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment
Take care to prevent spills, waste and minimize release to the environment.
Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place.
When using do not eat, drink or smoke.
Wash contaminated clothing before re-use.
Conditions for safe storage : Keep in properly labelled containers.
Store in accordance with the particular national regulations.
Materials to avoid : Do not store with the following product types:
Strong oxidizing agents

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>(dl)-a-Tocopheryl acetate</td>
<td>7695-91-2</td>
<td>TWA</td>
<td>5000 ug/m³ (OEB 1)</td>
<td>Internal</td>
</tr>
<tr>
<td>Vitamin A Palmitate</td>
<td>79-81-2</td>
<td>TWA</td>
<td>&gt;= 1 &lt; 10 ug/m³ (OEB 4)</td>
<td>Internal</td>
</tr>
<tr>
<td>Colecalciferol</td>
<td>67-97-0</td>
<td>TWA</td>
<td>5 µg/m³ (OEB 4)</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wipe limit</td>
<td>50 µg/100 cm²</td>
<td>Internal</td>
</tr>
</tbody>
</table>

Engineering measures : Ensure adequate ventilation, especially in confined areas. Minimize workplace exposure concentrations.

Personal protective equipment

Respiratory protection : If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.
Filter type : Organic vapour type
Hand protection : 
Remarks : Wash hands before breaks and at the end of workday.
Eye protection : Wear the following personal protective equipment:
Safety glasses
Skin and body protection : Skin should be washed after contact.
SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Aqueous solution

Colour : yellow

Odour : characteristic

Odour Threshold : No data available

pH : No data available

Melting point/freezing point : -5 °C

Initial boiling point and boiling range : 194 °C

Flash point : 244 °C

Evaporation rate : No data available

Flammability (solid, gas) : Not applicable

Flammability (liquids) : Not applicable

Upper explosion limit / Upper flammability limit : No data available

Lower explosion limit / Lower flammability limit : No data available

Vapour pressure : No data available

Relative vapour density : No data available

Relative density : 0.9 - 0.94

Density : No data available

Solubility(ies)
Water solubility : practically insoluble

Solubility in other solvents : slightly soluble
Solvent: Ethanol

Partition coefficient: n-octanol/water : Not applicable

Auto-ignition temperature : No data available

Decomposition temperature : No data available

Viscosity
Viscosity, dynamic : 68.41 - 68.81 mPa.s (25 °C)
Method: Brookfield
Viscosity, kinematic : No data available
Explosive properties : Not explosive
Oxidizing properties : The substance or mixture is not classified as oxidizing.
Molecular weight : No data available
Particle size : Not applicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Not classified as a reactivity hazard.
Chemical stability : Stable under normal conditions.
Possibility of hazardous reactions : Can react with strong oxidizing agents.
Conditions to avoid : None known.
Incompatible materials : Oxidizing agents
Hazardous decomposition products : No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION

Exposure routes : Inhalation
    Skin contact
    Ingestion
    Eye contact

Acute toxicity
Not classified based on available information.

Components:
(dl)-a-Tocopheryl acetate:
Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg
Acute dermal toxicity : LD50 (Rat): > 3,000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

Vitamin A Palmitate:
Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg
Remarks: Based on data from similar materials

Colecalciferol:
Acute oral toxicity : LD50 (Rat, male): 35 mg/kg
Acute inhalation toxicity : Acute toxicity estimate: 0.05 mg/l
    Exposure time: 4 h
    Test atmosphere: dust/mist
    Method: Expert judgement
Acute dermal toxicity  :  Acute toxicity estimate: 50 mg/kg
                     Method: Expert judgement

Skin corrosion/irritation
Not classified based on available information.

Components:
(dl)-a-Tocopheryl acetate:
Species  :  Rabbit
Method   :  OECD Test Guideline 404
Result   :  No skin irritation

Vitamin A Palmitate:
Species  :  Rabbit
Method   :  OECD Test Guideline 404
Result   :  Mild skin irritation

Serious eye damage/eye irritation
Not classified based on available information.

Components:
(dl)-a-Tocopheryl acetate:
Species  :  Rabbit
Result   :  No eye irritation
Method   :  OECD Test Guideline 405

Vitamin A Palmitate:
Species  :  Rabbit
Result   :  No eye irritation
Method   :  OECD Test Guideline 405

Colecalciferol:
Species  :  Rabbit
Result   :  No eye irritation

Respiratory or skin sensitisation

Skin sensitisation
Not classified based on available information.

Respiratory sensitisation
Not classified based on available information.

Components:
(dl)-a-Tocopheryl acetate:
Test Type     :  Draize Test
Exposure routes:  Skin contact
Species       :  Humans
Result        :  negative
Vitamin A Palmitate:
Test Type: Maximisation Test
Exposure routes: Skin contact
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative

Colecalciferol:
Test Type: Maurer optimisation test
Exposure routes: Skin contact
Species: Guinea pig
Result: negative

Chronic toxicity
Germ cell mutagenicity
Not classified based on available information.

Components:
(dl)-a-Tocopheryl acetate:
Genotoxicity in vitro: Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: negative

Genotoxicity in vivo: Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Vitamin A Palmitate:
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vivo: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Ingestion
Method: OECD Test Guideline 474
Result: negative

Colecalciferol:
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: equivocal
Genotoxicity in vivo:
- Test Type: In vitro mammalian cell gene mutation test
  Method: OECD Test Guideline 476
  Result: negative

- Test Type: Chromosome aberration test in vitro
  Method: OECD Test Guideline 473
  Result: negative

Germ cell mutagenicity:
- Weight of evidence does not support classification as a germ cell mutagen.

Carcinogenicity:
Not classified based on available information.

Components:
(dl)-a-Tocopheryl acetate:
- Species: Rat
- Application Route: Ingestion
- Exposure time: 104 weeks
- Result: negative

Reproductive toxicity:
Not classified based on available information.

Components:
(dl)-a-Tocopheryl acetate:
- Effects on fertility:
  Test Type: Reproduction/Developmental toxicity screening test
  Species: Rat
  Application Route: Ingestion
  Result: negative

- Effects on foetal development:
  Test Type: Embryo-foetal development
  Species: Rabbit
  Application Route: Ingestion
  Result: negative

Vitamin A Palmitate:
- Effects on foetal development:
  Test Type: Embryo-foetal development
  Species: Monkey
## Reproductive toxicity - Assessment
Positive evidence of adverse effects on development from human epidemiological studies.

### STOT - single exposure
Not classified based on available information.

### STOT - repeated exposure
Not classified based on available information.

### Components:

#### Vitamin A Palmitate:
- **Exposure routes**: Ingestion
- **Target Organs**: Liver
- **Assessment**: Causes damage to organs through prolonged or repeated exposure.
- **Remarks**: Based on data from similar materials

#### Colecalciferol:
- **Exposure routes**: Ingestion
- **Target Organs**: Kidney, Blood, Bone
- **Assessment**: Shown to produce significant health effects in animals at concentrations of 10 mg/kg bw or less.

### Repeated dose toxicity

#### Components:

##### (dl)-a-Tocopheryl acetate:
- **Species**: Rat
- **NOAEL**: 500 mg/kg
- **Application Route**: Ingestion
- **Exposure time**: 90 Days

##### Vitamin A Palmitate:
- **Species**: Rat
- **LOAEL**: > 1 - 10 mg/kg
- **Application Route**: Ingestion
- **Exposure time**: 3 Months
- **Remarks**: Based on data from similar materials

##### Colecalciferol:
- **Species**: Rat
- **NOAEL**: 0.06 mg/kg
- **LOAEL**: 0.3 mg/kg
- **Application Route**: Ingestion
- **Exposure time**: 90 Days
- **Method**: OECD Test Guideline 408
Aspiration toxicity
Not classified based on available information.

Experience with human exposure

Components:

Vitamin A Palmitate:
Ingestion:
Symptoms: liver impairment
Remarks: Based on data from similar materials
Symptoms: Embryo-foetal toxicity
Remarks: Based on data from similar materials

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

(dl)-a-Tocopheryl acetate:
Toxicity to fish:
LC50 (Onchorhynchus mykiss (rainbow trout)): > 100 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates:
EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants:
ErC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): >= 100 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity):
NOEC (Onchorhynchus mykiss (rainbow trout)): 100 mg/l
Exposure time: 28 d

Toxicity to microorganisms:
EC50: > 927 mg/l
Exposure time: 30 min
Method: ISO 8192

Vitamin A Palmitate:
Toxicity to fish:
LC50 (Leuciscus idus (Golden orfe)): > 1,000 mg/l
Exposure time: 96 h
Method: DIN 38412
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates:
EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202
Remarks: Based on data from similar materials
Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): 152.94 mg/l
Exposure time: 72 h

**Colecalciferol:**
Toxicity to fish : LL50 (Danio rerio (zebra fish)): > 100 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EL50 (Scenedesmus capricornutum (fresh water algae)): > 100 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 201

**Persistence and degradability**

**Components:**

**(dl)-a-Tocopheryl acetate:**
Biodegradability : Result: Not readily biodegradable.
Biodegradation: 21.7 - 31 %
Exposure time: 28 d
Method: OECD Test Guideline 301C

**Vitamin A Palmitate:**
Biodegradability : Result: Not readily biodegradable.
Biodegradation: 40 - 50 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

**Colecalciferol:**
Biodegradability : Result: Not readily biodegradable.
Biodegradation: <= 7 %
Exposure time: 28 d
Method: OECD Test Guideline 301C

**Bioaccumulative potential**

**Components:**

**Vitamin A Palmitate:**
Partition coefficient: n-octanol/water : log Pow: > 6.2

**Colecalciferol:**
Partition coefficient: n-octanol/water : log Pow: > 6.2
Method: OECD Test Guideline 107
Mobility in soil
No data available

Other adverse effects
No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods
Waste from residues: Dispose of in accordance with local regulations.
Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal.
If not otherwise specified: Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG
Not regulated as a dangerous good

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

National Regulations

ADG
Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

Prohibition/Licensing Requirements: There is no applicable prohibition, authorisation and restricted use requirements, including for carcinogens referred to in Schedule 10 of the model WHS Act and Regulations.

The components of this product are reported in the following inventories:
AICS: not determined
DSL: not determined
SAFETY DATA SHEET

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SECTION 16. OTHER INFORMATION

Further information

Revision Date : 10.10.2020

Date format : dd.mm.yyyy

Full text of other abbreviations

AILIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50% of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

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 is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their
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