SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form: Mixture
Trade name: DKW/Juglans medium (Micro and Macro elements)
Product code: D0246
Product group: Raw material

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

1.2.1. Relevant identified uses

Main use category: Professional use
Industrial/Professional use spec: For professional use only, Duchefa Biochemie B.V. products are intended only for "in vitro laboratory" research purposes.

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Manufacturer
Duchefa Biochemie B.V.
A. Hofmanweg 71
2031 BH Haarlem - The Netherlands
T +31(0)23-5319093 - F +31(0)23-5318027
info@duchefa.nl

1.4. Emergency telephone number

Emergency number: Supplier contact information:
+31(0)23-5319093 (M-F 09:00-17:00)
+31(0)6-30109355 (outside office hours)

<table>
<thead>
<tr>
<th>Organisation/Company</th>
<th>Address</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Health Organization world directory of poison centres</td>
<td><a href="http://apps.who.int/poisoncentres/">http://apps.who.int/poisoncentres/</a></td>
<td>Consult website for a local poison centre</td>
</tr>
</tbody>
</table>

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Skin corrosion/irritation, Category 2: H315
Serious eye damage/eye irritation, Category 2: H319
Specific target organ toxicity — Single exposure, Category 3: H335
Respiratory tract irritation

Full text of H statements: see section 16

Adverse physicochemical, human health and environmental effects

No additional information available
2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) : GHS07

Signal word (CLP) : Warning

Hazard statements (CLP) : H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H335 - May cause respiratory irritation.

Precautionary statements (CLP) : P261 - Avoid breathing dust.
P302+P352 - IF ON SKIN: Wash with plenty of water.
P305+P351 - IF IN EYES: Rinse cautiously with water for several minutes.

Extra phrases : Based on research by TNO in Rijswijk (The Netherlands), commissioned by Duchefa Biochemie B.V. in Haarlem, the medium has no oxidising or explosive properties. As such the substance is not classified as oxidizing (H272, GHS03).

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>Classification according to Regulation (EC) No. 1272/2008 [CLP]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium nitrate hydrate</td>
<td>(CAS-No.) 35054-52-5 (EC-No.) 231-915-5</td>
<td>30,379</td>
<td>Ox. Sol. 1, H271</td>
</tr>
<tr>
<td>Potassium sulfate</td>
<td>(CAS-No.) 7778-80-5 (EC-No.) 231-915-5</td>
<td>28,452</td>
<td>Not classified</td>
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<tr>
<td>Ammonium nitrate</td>
<td>(CAS-No.) 6484-52-2 (EC-No.) 229-347-8</td>
<td>25,842</td>
<td>Ox. Sol. 3, H272</td>
</tr>
<tr>
<td>Magnesium sulfate anhydrous</td>
<td>(CAS-No.) 7487-88-9 (EC-No.) 231-298-2</td>
<td>6,597</td>
<td>Not classified</td>
</tr>
<tr>
<td>Potassium dihydrogenphosphate</td>
<td>(CAS-No.) 7778-77-0 (EC-No.) 231-913-4</td>
<td>4,836</td>
<td>Not classified</td>
</tr>
<tr>
<td>Calcium chloride</td>
<td>(CAS-No.) 10043-52-4 (EC-No.) 233-140-8 (EC Index-No.) 017-013-00-2</td>
<td>2,053</td>
<td>Eye Irrit. 2, H319</td>
</tr>
<tr>
<td>Ethylenediaminetetraacetate ferric sodium</td>
<td>(CAS-No.) 15708-41-5 (EC-No.) 239-802-2</td>
<td>0,814</td>
<td>Not classified</td>
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<tr>
<td>Manganese sulfate monohydrate</td>
<td>(CAS-No.) 10034-96-5 (EC-No.) 232-089-9 (EC Index-No.) 025-003-00-4</td>
<td>0,617</td>
<td>Eye Dam. 1, H318 STOT RE 2, H373 Aquatic Chronic 2, H411</td>
</tr>
</tbody>
</table>
DKW/Juglans medium  
(Micro and Macro elements)  
Safety Data Sheet  
according to Regulation (EU) 2015/830

<table>
<thead>
<tr>
<th>Substance</th>
<th>Product identifier</th>
<th>Specific concentration limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc sulphate</td>
<td>(CAS-No.) 7446-20-0 (EC-No.) 231-793-3 (EC Index-No.) 030-006-00-9</td>
<td>0,31 Acute Tox. 4 (Oral), H302, Eye Dam. 1, H318 Aquatic Acute 1, H400 Aquatic Chronic 1, H410</td>
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<tr>
<td>Boric acid substance listed as REACH Candidate</td>
<td>(CAS-No.) 10043-35-3 (EC-No.) 233-139-2 (EC Index-No.) 005-007-00-2</td>
<td>0,0876 Repr. 1B, H360FD</td>
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<tr>
<td>Sodium molybdate dihydrate</td>
<td>(CAS-No.) 10102-40-6 (EC-No.) 231-551-7</td>
<td>0,0071 Not classified</td>
</tr>
<tr>
<td>Copper sulphate</td>
<td>(CAS-No.) 7758-99-8 (EC-No.) 231-847-6 (EC Index-No.) 029-004-00-0</td>
<td>0,0046 Acute Tox. 4 (Oral), H302 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Aquatic Acute 1, H400 Aquatic Chronic 1, H410</td>
</tr>
</tbody>
</table>

Full text of H-statements: see section 16

**SECTION 4: First aid measures**

4.1. Description of first aid measures

First-aid measures general : Seek medical attention if ill effect develops.
First-aid measures after inhalation : Remove victim to fresh air.
First-aid measures after skin contact : Wash skin with mild soap and water.
First-aid measures after eye contact : Rinse with water.
First-aid measures after ingestion : Rinse mouth.

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

Symptoms/effects after skin contact : Causes skin irritation.
Symptoms/effects after eye contact : Redness, pain.

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

No additional information available

**SECTION 5: Firefighting measures**

5.1. Extinguishing media

Suitable extinguishing media : Alcohol resistant foam.  
Dry chemical powder.  
Carbon dioxide (CO2).  
Water spray.
5.2. Special hazards arising from the substance or mixture
Hazardous decomposition products in case of fire: Under fire conditions, hazardous fumes will be present:
- COx
- NOx
- SOx.

5.3. Advice for firefighters
Firefighting instructions: Prevent fire fighting water from entering the environment.
Protection during firefighting: Wear proper protective equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
General measures: Avoid raising powdered materials into airborne dust.

6.1.1. For non-emergency personnel
Emergency procedures: Wear suitable protective clothing.

6.1.2. For emergency responders
No additional information available

6.2. Environmental precautions
Prevent entry to sewers and public waters.

6.3. Methods and material for containment and cleaning up
Methods for cleaning up: Sweep up dry powder and dispose properly.

6.4. Reference to other sections
No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Precautions for safe handling: Avoid dust formation. Handle in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for safe storage, including any incompatibilities
Storage conditions: Store at room temperature
- Store in dry, well-ventilated area
- Hygroscopic
- Keep container tightly closed and dry.

7.3. Specific end use(s)
For professional use only. Duchefa Biochemie B.V. products are intended only for "in vitro laboratory" research purposes.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
No additional information available

8.2. Exposure controls
Hand protection:
DKW/Juglans medium  
(Micro and Macro elements)  
Safety Data Sheet  
according to Regulation (EU) 2015/830

<table>
<thead>
<tr>
<th>Type</th>
<th>Material</th>
<th>Permeation</th>
<th>Thickness (mm)</th>
<th>Standard</th>
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</thead>
<tbody>
<tr>
<td>Gloves</td>
<td>Nitrile rubber (NBR)</td>
<td>6 (&gt; 480 minutes)</td>
<td>0,11</td>
<td>EN 374</td>
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</tbody>
</table>

**Eye protection:**  
Safety glasses (to European standard EN 166 or equivalent)

**Skin and body protection:**  
In case of possible repeated skin contact wear protective clothing

**Respiratory protection:**  
Where excessive dust may result, wear approved mask. Type P2 (EN 143)

**SECTION 9: Physical and chemical properties**

9.1. Information on basic physical and chemical properties

- **Physical state**: Solid
- **Appearance**: Powder.
- **Colour**: White to slightly yellow.
- **Odour**: Characteristic. Weak.
- **Odour threshold**: No data available
- **pH**: No data available
- **Relative evaporation rate (butylacetate=1)**: No data available
- **Melting point**: No data available
- **Freezing point**: No data available
- **Boiling point**: No data available
- **Flash point**: No data available
- **Auto-ignition temperature**: No data available
- **Decomposition temperature**: No data available
- **Flammability (solid, gas)**: No data available
- **Vapour pressure**: No data available
- **Relative vapour density at 20 °C**: No data available
- **Relative density**: No data available
- **Solubility**: Readily soluble in water.
- **Log Pow**: No data available
- **Viscosity, kinematic**: No data available
- **Viscosity, dynamic**: No data available
- **Explosive properties**: No data available
- **Oxidising properties**: No data available
- **Explosive limits**: No data available

9.2. Other information

No additional information available

**SECTION 10: Stability and reactivity**

10.1. Reactivity

Stable under normal conditions of storage, handling and use.
10.2. Chemical stability
Stable under normal conditions.

10.3. Possibility of hazardous reactions
No additional information available

10.4. Conditions to avoid
Moisture.

10.5. Incompatible materials
Strong oxidizers.

10.6. Hazardous decomposition products
Thermal decomposition generates:
- COx
- NOx
- SOx
- Phosphorus oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute toxicity: Not classified
Skin corrosion/irritation: Causes skin irritation.
Serious eye damage/irritation: Causes serious eye irritation.
Respiratory or skin sensitisation: Not classified
Germ cell mutagenicity: Not classified
Carcinogenicity: Not classified

Reproductive toxicity: Not classified
STOT-single exposure: May cause respiratory irritation.
STOT-repeated exposure: Not classified
Aspiration hazard: Not classified

SECTION 12: Ecological information

12.1. Toxicity
No additional information available

12.2. Persistence and degradability
No additional information available

12.3. Bioaccumulative potential
No additional information available

12.4. Mobility in soil
No additional information available
12.5. Results of PBT and vPvB assessment
No additional information available

12.6. Other adverse effects
Additional information: Prevent entry to sewers and public waters. Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Waste treatment methods: Dispose in a safe manner in accordance with local/national regulations. Avoid release to the environment.

SECTION 14: Transport information

In accordance with ADR / IATA / IMDG

<table>
<thead>
<tr>
<th>ADR</th>
<th>IMDG</th>
<th>IATA</th>
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<tbody>
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<td>14.1.</td>
<td>UN number</td>
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<tr>
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<td>Packing group</td>
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<tr>
<td>Not regulated</td>
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<tr>
<td>14.5.</td>
<td>Environmental hazards</td>
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</tr>
<tr>
<td>Not regulated</td>
<td>Not regulated</td>
<td>Not regulated</td>
</tr>
</tbody>
</table>

14.6. Special precautions for user
- Overland transport
  Not regulated
- Transport by sea
  Not regulated
- Air transport
  Not regulated

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code
  Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
15.1.1. EU-Regulations
Contains no REACH substances with Annex XVII restrictions
Contains no substance on the REACH candidate list ≥ 0,1 % / SCL
15.1.2. National regulations
Ensure all national/local regulations are observed.

Germany
Reference to AwSV : Water hazard class (WGK) 3, severe hazard to water (Classification according to AwSV, Annex 1)
12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Netherlands
SZW-lijst van kankerverwekkende stoffen : Manganese sulfate monohydrate is listed
SZW-lijst van mutagene stoffen : Manganese sulfate monohydrate is listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : Boric acid is listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling : Boric acid is listed

Denmark
Recommendations Danish Regulation : Young people below the age of 18 years are not allowed to use the product
Pregnant/breastfeeding women working with the product must not be in direct contact with the product

15.2. Chemical safety assessment
No additional information available

SECTION 16: Other information

Indication of changes:

| 2.2 | Hazard statements (CLP) | Added | H315;H319;H335 |
| 2.2 | Signal word (CLP) | Added | Warning |
| 2.2 | Hazard pictograms (CLP) | Added | GHS07 |
| 2.2 | Precautionary statements (CLP) | Added | P261;P302+P352;P305+P351 |

Abbreviations and acronyms:

| ATE | Acute Toxicity Estimate |
| ADR | European Agreement concerning the International Carriage of Dangerous Goods by Road |
| BCF | Bioconcentration factor |
| CLP | Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008 |
| DPD | Dangerous Preparations Directive 1999/45/EC |
| DSD | Dangerous Substances Directive 67/548/EEC |
| IATA | International Air Transport Association |
| IMDG | International Maritime Dangerous Goods |
| LC50 | Median lethal concentration |
| LD50 | Median lethal dose |
| LOAEL | Lowest Observed Adverse Effect Level |
Full text of H- and EUH-statements:

<table>
<thead>
<tr>
<th>Acute Tox. 4 (Oral)</th>
<th>Acute toxicity (oral), Category 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic Acute 1</td>
<td>Hazardous to the aquatic environment — Acute Hazard, Category 1</td>
</tr>
<tr>
<td>Aquatic Chronic 1</td>
<td>Hazardous to the aquatic environment — Chronic Hazard, Category 1</td>
</tr>
<tr>
<td>Aquatic Chronic 2</td>
<td>Hazardous to the aquatic environment — Chronic Hazard, Category 2</td>
</tr>
<tr>
<td>Eye Dam. 1</td>
<td>Serious eye damage/eye irritation, Category 1</td>
</tr>
<tr>
<td>Eye Irrit. 2</td>
<td>Serious eye damage/eye irritation, Category 2</td>
</tr>
<tr>
<td>Ox. Sol. 1</td>
<td>Oxidising Solids, Category 1</td>
</tr>
<tr>
<td>Ox. Sol. 3</td>
<td>Oxidising Solids, Category 3</td>
</tr>
<tr>
<td>Repr. 1B</td>
<td>Reproductive toxicity, Category 1B</td>
</tr>
<tr>
<td>Skin Irrit. 2</td>
<td>Skin corrosion/irritation, Category 2</td>
</tr>
<tr>
<td>STOT RE 2</td>
<td>Specific target organ toxicity — Repeated exposure, Category 2</td>
</tr>
<tr>
<td>STOT SE 3</td>
<td>Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation</td>
</tr>
</tbody>
</table>

H271 May cause fire or explosion; strong oxidiser.
H272 May intensify fire; oxidiser.
H302 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H360FD May damage fertility. May damage the unborn child.
H373 May cause damage to organs through prolonged or repeated exposure.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects
H411 Toxic to aquatic life with long lasting effects.

SDS Biochemicals version 2018

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.