University of Reading

Murashige and Skoog medium

Safety data sheet

Prepared in accordance with Regulation (EC) No. 1907/2006 (REACH)
Version 1.0 | Created: 27 May 2014 | Revised: 1 June 2015

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

Product identifier	Murashige and Skoog medium with vitamins and agar
Trade name/Brand	Not applicable
Synonym(s)	MS medium with agar
REACH number	Mixture, not applicable
CAS number	Mixture, not applicable
EC number	Mixture, not applicable
Relevant identified uses	Plant growth medium used for plant tissue culture. Laboratory use only. The growth medium should be prepared from the powder in accordance with the instructions in the NCBE *Cauliflower cloning kit* (See Section 16).
Uses advised against	None.
Supplier of the product and of this safety data sheet	National Centre for Biotechnology Education (NCBE) University of Reading 2 Earley Gate Whiteknights READING RG6 6AU United Kingdom T: 0118 9873743 F: 0118 9750140 E: NCBE@reading.ac.uk W: www.ncbe.reading.ac.uk
Manufacturer of the product	Duchefa Biochemie bv A. Hofmanweg 71 2031 BH Haarlem The Netherlands T: + 31 23 531 90 93 F: + 31 23 531 80 27 E: info@duchefa.nl W: www.duchefa-biochemie.com
Emergency telephone numbers	0118 9873743 (NCBE, University of Reading. 08.30 to17.00 weekdays only) + 31 23 531 90 93 (Duchefa Biochemie. 09.00 to 17.00 CET)

SECTION 2. Hazards identification

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

Oxidizing solids (Cat. 3), H272
Skin irritation (Cat. 2), H315
Eye irritation (Cat. 2), H319
Specific target organ toxicity – single exposure (Cat. 3), Respiratory system, H335

Label elements

WARNING

H272	May intensify fire; oxidiser
H315	Causes skin irritation
H319	Causes serious eye irritation
H335	May cause respiratory irritation
P220	Keep/Store away from clothing/combustible materials
P261	Avoid breathing dust
P305+P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Other hazards

None.

Note: Some statements are ommited from the product label, as the volume of the mixture is less than 125 ml.

SECTION 3. Composition/information on ingredients

Name of component (Synonym) [CLP Index number]	Weight (%)	EC (EINECS) number	CAS number	REACH registration number	Classification under Regulation (EC) No 1272/2008 [CLP]*
Agar (Agar agar) [Not indexed under CLP yet]	63.33	232-658-1	9002-18-0	–	–
Potassium nitrate [Not indexed under CLP yet]	15.82	231-818-8	7757-79-1	01-2119488224-35	Ox. Sol. 2 (H272) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) STOT SE 3 (H335)
Ammonium nitrate [Not indexed under CLP yet]	13.74	229-347-8	6484-52-2	–	Ox. Sol. 3 (H272) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) STOT SE 3 (H335)
Calcium chloride [017-013-00-2]	2.76	233-140-8	10043-52-2	–	Eye Irrit. 2 (H319)
Magnesium sulfate [Not indexed under CLP yet]	1.50	231-298-2	7487-88-9	–	–
Potassium dihydrogen-orthophosphate [Not indexed under CLP yet]	1.42	231-913-4	7778-77-0	–	–
Myo-inositol [Not indexed under CLP yet]	0.83	201-781-2	87-89-8	–	–
Ethylenediaminetetraacetic acid iron(III) sodium salt (Sodium feredetate) [Not indexed under CLP yet]	0.30	239-802-2	15708-41-5	–	Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) STOT SE 3 (H335)
Manganese sulfate monohydrate [025-003-00-4]	0.14	232-089-9	10034-96-5	–	STOT RE 2 (H373) Aquatic Chronic 2 (H411)

* *These classifications refer to the pure (100%) substances.*

The concentrations of many compounds in the MS medium are well below the thresholds at which they are thought to present a hazard. Most of these compounds have not been listed in the table above, although the last three compounds, all present at less than 1% w/w (and therefore not thought to constitute a hazard) have. The table should not be taken as a guide to the full composition of the growth medium.

For the full text of the safety classifications (H statements), refer to Section 16.

SECTION 4. First aid measures

General information	Seek medical attention if an ill effect develops. Show this safety data sheet to the doctor.
Inhalation	Move the casualty to fresh air. If the casualty is not breathing, give artificial respiration. Consult a doctor.
Skin contact	Wash skin with water and mild soap. Seek medical attention if irritation occurs.
Eye contact	Check for and remove contact lenses if present. Rinse opened eye immediately with running water, also wash under the eyelids, for at least 15 minutes. Seek medical advice immediately.
Ingestion	Rinse out mouth with water, then drink plenty of water. Do not induce vomiting. Seek medical help immediately.
Self-protection of the first aider	Rinse your hands with water after handling the powder.
Most important symptoms and effects, both acute and delayed	Causes serious eye irritation. May cause skin irritation. May cause respiratory irritation.
Indication of any immediate medical attention and special treatment	IF IN EYES: Rinse thoroughly with plenty of water for at least 15 minutes. Remove contact lenses if present and easy to do. Continue rinsing. Seek medical advice and show this Safety Data Sheet to the doctor.
Advice to doctor	No additional information available.

SECTION 5. Firefighting measures

Extinguishing media
Water spray, carbon dioxide, foam or dry powder.

Special hazards arising from the substance or mixture
Under fire conditions, hazardous fumes will be present: carbon oxides (COx), nitrogen oxides (NOx), sulphur oxides (SOx), oxides of phosphorus, hydrogen chloride gas, potassium oxides, sodium oxides, magnesium oxide, cobalt/cobalt oxides, calcium oxide and copper oxides.

Advice for firefighters
Wear protective equipment and self-contained breathing apparatus if the quantity of the substance involved warants it.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Avoid contact with skin and eyes. Wear a lab coat and eye protection. Ensure adequate ventilation when handling the powder, but avoid raising an airborne dust. As the powder provided in the kit is pre-weighed, contact with the powder and the chances of producing dust are small, but if necessary wear protective gloves and a face mask.

In an emergency, evacuate personnel to safe areas. Avoid breathing the dust.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let the product enter drains. Discharge into the environment must be avoided.

Methods and material for containment and cleaning up
Wear a face mask, eye protection, a lab coat and gloves. Sweep up the dry powder withn a dustpan and brush. Wash the surface with water and dry with paper towels. Dispose of the waste as described in Section 13.

Reference to other sections
See Section 13 for disposal instructions. See Section 8 for personal protection details.

SECTION 7. Handling and storage

Precautions for safe handling
Avoid raising or inhaling any airborne dust.

Conditions for safe storage, including any incompatibilities
Store in dry conditions at room temperature. Dispose of the powder if it has absorbed moisture and become darker and/or formed a solid lump.

Specific end use(s)
For laboratory use only, according to the instructions in the NCBE *Cauliflower cloning kit*.

SECTION 8. Exposure controls/personal protection

Control parameters

Exposure limits

Components with workspace control parameters

Component	CAS Number	Workplace exposure limit		Legal basis
Manganese sulfate monohydrate	10034-96-5	Long term exposure limit (8 hour time-weighted average reference period)	0.5 mg/m^3	UK. EH40 WEL
		Short-term exposure limit (15 minute reference period)	1.5 mg/m^3	

Biological limit values No information available.
Derived no effect level No information available.
Predicated no effect level No information available.

Exposure controls

Handle in accordance with good laboratory hygiene and safety practice. Wear safety glasses when handling the powder. Where excessive dust may result, wear a suitable mask. Wash hands before breaks and after handling the mixture.

SECTION 9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state	Powder.
Appearence	Light yellow, dry powder.
Odour	Weak or odourless.
pH	~ 5.7 when made up as directed.
Solubility	Highly soluble in water.

Other information

The powder is hygroscopic and must be kept dry. Dispose of the powder if it has absorbed moisture and become darker and/or formed a solid lump.

SECTION 10. Stability and reactivity

Reactivity	No information available.
Chemical stability	When stored dry and at room temperature, the product is stable.
Possibility of hazardous reactions	No known hazardous reactions.
Conditions to avoid	Moisture.
Incompatible materials	Strong reducing agents; Strong acids; Powdered metals.
Hazardous decomposition products	When heated to decomposition, emits dangerous fumes: carbon oxides (COx), nitrogen oxides (NOx), sulphur oxides (SOx), oxides of phosphorus, hydrogen chloride gas, potassium oxides, sodium oxides, magnesium oxide, cobalt/cobalt oxides, calcium oxide and copper oxides.

SECTION 11. Toxicological information

Information on toxicological effects

Accute toxicity	No information available.
Irritation	No information available.
Corrosivity	No information available.
Sensitisation	No information available.
Repeated dose toxicity	No information available.
Carcinogenicity	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
Mutagenicity	No information available.
Toxicity for reproduction	No information available.

SECTION 12. Ecological information

Toxicity	No information available.
Persistance and degradability	No information available.
Bioaccumulative potential	No information available.
Mobility in soil	No information available.
Results of PBT and vPVB assessment	No information available.
Other adverse effects	Toxic to aquatic life with long lasting effects.

SECTION 13. Disposal considerations

Waste treatment methods — Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company.

Waste from residues/unused product — Dispose of in a safe manner in accordance with local/national regulations.
Contaminated packaging — Avoid release into the environment.

SECTION 14. Transport information

UN number		
ADR/RID: 1477	IMDG: 1477	IATA: 1477
UN proper shipping name		
ADR/RID: Nitrates, inorganic, N.O.S.	IDMG: Nitrates, inorganic, N.O.S.	IATA: Nitrates, inorganic, N.O.S.
Transport hazard class		
ADR/RID: 5.1	IDMG: 5.1	IATA: 5.1
Packaging group		
ADR/RID: II	IDMG: II	IATA: II
Environmental hazards		
ADR/RID: None	IDMG: None	IATA: None

SECTION 15. Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture
No information available.

Chemical safety assessment

No information available.

SECTION 16. Other information

Full text of GHS hazard statements

H272	May intensify fire; oxidiser.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H411	Toxic to aquatic life with long lasting effects.

Note that this Safety Data Sheet refers to the Murashige and Skoog agar powder, not to the dilute growth medium that is made from it.

Usage and handling instructions are given in this Safety Data Sheet and in the Teacher's guide which accompanies the NCBE *Cauliflower cloning kit*. This can be downloaded from the NCBE's Web site: **www.ncbe.reading.ac.uk/ptc**

The information given in this Safety Data Sheet is based on the present state of our knowledge.

This Safety Data Sheet has been compiled and is solely intended for this product.

This Safety Data Sheet was revised on 1 June 2015, when the older (67/548/EEC [DSD]) safety classifications were deleted.

END OF SAFETY DATA SHEET