MATERIAL SAFETY DATA SHEET

IONOL 46

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY

Product name: Ionol 46
Intended Use Antioxidant
CAS Number 119-47-1
EINECS Number 204-327-1
Registration number REACH Preregistration Nr. 05-2114106914-53-0000
Supplier
Castle Chemicals Ltd, Peak House
6 Oxford Road, Altrincham, Cheshire WA14 2DY
Tel: +44 161 608 8800 Fax: +44 161 608 1910
Email: Info@castlechemicals.com

2. HAZARD IDENTIFICATION

Classification of the substance or mixture
Classification according to Regulation (EC) No 1272/2008
Repr. 2 H361 Suspected of damaging fertility or the unborn child.
Aquatic Chronic 4 H413 May cause long lasting harmful effects to aquatic life.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC
R62: Possible risk of impaired fertility.
R53: May cause long-term adverse effects in the aquatic environment.

Labelling according to Regulation (EC) No 1272/2008
The substance is classified and labelled according to the CLP regulation.

Hazard pictograms GHS08
Signal word Warning

Hazard-determining components of labelling 2,2’-Methylenbis(4-methyl-6-tert-butylphenol)

Hazard statements H361 Suspected of damaging fertility or the unborn child. H413 May cause long lasting harmful effects to aquatic
Precautionary statements

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P273 Avoid release to the environment.
P281 Use personal protective equipment as required.
P220 Keep away from alkaline solutions.
P220 Keep away from oxidising agents and acidic substances.
P309 IF exposed or if you feel unwell:
P313 Get medical advice/attention if you feel unwell.
P401 Store in accordance with local/regional/national/international regulations.
P410 Protect from sunlight.
P403 Store in a well-ventilated place.
P402+P404 Store in a dry place. Store in a closed container.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

Results of PBT and vPvB assessment

PBT: Not applicable.
vPvB: Not applicable.

3. COMPOSITION INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical characterization</th>
<th>Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS No. Description</td>
<td>119-47-1 6,6′-di-tert-butyl-2,2′-methylenedi-p-cresol</td>
</tr>
<tr>
<td>Identification number(s)</td>
<td>EINECS Number - 204-327-1</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

General information

Personal protection for the First Aider.
Immediately remove any clothing soiled by the product.
Take affected persons out of danger area and lay down.
Position and transport stably in side position.
Artificial respiration with respiration bag or respirator

After inhalation

Take affected persons into fresh air and keep quiet.
Seek medical treatment in case of complaints.

After skin contact

Immediately wash with water and soap and rinse thoroughly. If skin irritation continues, consult a doctor.

After eye contact

Rinse opened eye for several minutes under running water. In case of irritation consult an oculist.

After swallowing

Rinse out mouth and then drink plenty of water.
Induce vomiting only, if affected person is fully conscious.
Vomiting, possible danger of aspiration, keep breathing passages free Seek medical treatment.

Information for doctor

If indication of any immediate medical attention and special treatment needed treat symptomatically
5. FIREFIGHTING MEASURES

Suitable extinguishing agents: CO2, powder or water spray. Fight larger fire with alcohol resistant foam.

Special hazards arising from the substance or mixture: Carbon monoxide and carbon dioxide, Danger of forming toxic pyrolysis products.

Advice for firefighters:
- Wear fully protective suit. Do not inhale explosion gases or combustion gases. Wear self-contained respiratory protective device.

Additional information: Collect contaminated fire fighting water separately. It must not enter the sewage system.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:
- Use respiratory protective device against the effects of fumes/dust/aerosol. Wear protective equipment. Keep unprotected persons away. Keep away from ignition sources.

Environmental precautions:
- Damp down dust with water spray. Do not allow to enter sewers/ surface or ground water.

Methods and material for containment and cleaning up:
- Pick up mechanically. Dispose contaminated material as waste according to item 13. Ensure adequate ventilation.

Reference to other sections:
- See Section 7 for information on safe handling.
- See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.

7. HANDLING AND STORAGE

Handling:
- Ensure good ventilation/exhaustion at the workplace. Development and deposition of dust has to be avoided.

Information about fire - and explosion protection:
- Keep ignition sources away - Do not smoke. Protect against electrostatic charges. Dust can combine with air to form an explosive mixture.

Requirements to be met by storerooms and receptacles:
- Store only in the original receptacle.

Information about storage in one common storage facility:
- Do not store together with strong acids, alkalines and oxidation agents.
- Heating in presence of strong mineral acids will liberate Isobutylene.

Further information about storage conditions:
- Store in cool, dry conditions in well sealed receptacles. Store receptacle in a well ventilated area. Protect from humidity and water.

Maximum storage temperature:
- 40 °C
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Additional information about design of technical facilities:
No further data; see item 7.
Take appropriate measures against dust.

Control parameters
Ingredients with limit values that require monitoring at the workplace
Not required.
Additional information
The lists valid during the making were used as basis.
Personal protective equipment:
General protective and hygienic measures
Do not inhale gases / fumes / aerosols / dust. Immediately remove all soiled and contaminated clothing. Avoid contact with the eyes and skin.
Respiratory protection
Use suitable respiratory protective device in case of insufficient ventilation. In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.

Recommended filter device for short term use
Filter FFP2
Protection of hands
Protective gloves
Material of gloves
Nitrile rubber, NBR
Recommended material strength: ≥ 0.11 mm
Penetration time of glove material
Penetration time ≥ 8 h
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

Not suitable are gloves made of the following materials
Leather gloves, Strong material gloves
Eye protection
Safety glasses

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Flakes, Powder
Form
Colour
White to pale beige
Odour
Odourless
pH-value (111 g/l) at 20°C
~ 4 - 8
Change in condition
Melting point/Melting range
~ 125-132°C
Boiling point/Boiling range
n187 °C (0,07 mbar OEDS SID)
Flash point
190-210 °C (DIN 51758)
Ignition temperature
360°C (BIA Germany)
Decomposition temperature
≥ 280°C
Explosion limits
Lower: 30 g/m3
Upper: Minimal Ignition Energy : < 2, mJ
Vapour pressure at 50°C
< 0.00013 hPa
10. STABILITY AND REACTIVITY

Chemical stability
Thermal decomposition / conditions to be avoided
No decomposition if used according to specifications.
Possibility of hazardous reactions
Reacts with strong acids, alkalines and oxidizing agents.
When heating over 100 °C in the presence of mineral acids, iso butylenes will be released
Incompatible materials
Changes colour under influence of light.
Hazardous decomposition products
Carbon monoxide and carbon dioxide, Hydrocarbons
Danger of forming toxic pyrolysis products.

11. TOXICOLOGICAL INFORMATION

Acute toxicity:
LD/LC50 values relevant for classification:
119-47-1 2,2’-Methylenbis(4-methyl-6-tert-butylphenol)
Oral LD50
11000 mg/kg (Mouse (Maus))
RTECS, JTSCDR Journal of Toxicological Sciences. (Japanese Soc. of Toxicological Sciences, 4th Floor, Gakkai Center Bldg., 4-16, Yayoi 2-chome, Bunkyo-ku, Tokyo 113, Japan) V.1-1976- Volume(issue)/page/year: 19,77,1994
> 10000 mg/kg (Rat (Ratte)) OECD SIDS
LDLo
10000 mg/kg (Rat (Ratte))
RTECS, GISAAA Gigiena i Sanitariya. For English translation, see HYSAAV. (V/O Mezhdunarodnaya Kniga, 113095 Moscow, USSR) V.1-1936- Volume(issue)/page/year: 38(8),28,1973
Dermal LD50
> 10000 mg/kg (Rabbit (Kaninchen)) OECD SIDS
Primary irritant effect:
on the skin
No irritant effect.
on the eye
Slightly irritating, OECD 405 Mechanical irritation possible
Sensitization
Not a sensitizing agent. Patchtest Human IUCLID Local Lymph Node Assay, OECD 429
Chronic toxicity
Inhalation of the dusts should be avoided as even inert dusts may impair respiratory organ functions.
Possible risk of impaired fertility.
119-47-1 2,2’-Methylenbis(4-methyl-6-tert-butylphenol)

Oral NOAEL 50 mg/kg/day (Rat (Ratte))
Reproductive Tox., rat female, OECD 421, MHW, Japan, 1999
12.5 mg/kg/day (Rat (Ratte))
Reproductive Tox. rat male, OECD 421, MHW, Japan, 1999

Reproductive Tox. 25254 mg/kg (Rat (Ratte))
RTECS, TDLo, oral rat male 61 days pre-mating - ambiguous, ARTODN
Archives of Toxicology. (Springer-Verlag, Heidelberger Pl. 3, D-1000 Berlin 33, Fed. Rep. Ger.) V.32- 1974-
Volume(issue)/page/year: 80,225,2006
2946.3 mg/kg (Rat (Ratte))
TDLo, oral, rat male 61 days pre-mating - ambiguous, ARTODN
Archives of Toxicology. (Springer-Verlag, Heidelberger Pl. 3, D-1000 Berlin 33, Fed. Rep. Ger.) V.32- 1974-
Volume(issue)/page/year: 80,225,2006

Additional toxicological information
AMES test: No mutagenic effects
Salmonella typhimurium
Escherichia coli
OECD 471
MHW, Japan, 1996
Chromosome aberrations test: negativ
OECD 473
OECD SIDS
Gene Mutation Assay, In vitro Mammalian Cell Gene Mutation Test
OECD 476
Not a mutagenic agent.

12. ECOLOGICAL INFORMATION

Aquatic toxicity:
119-47-1 2,2’-Methylenbis(4-methyl-6-tert-butylphenol)
EC50
> 1000 mg/ltr. (Bacteria (Bakterien)) External MSDS
> 4.8 mg/ltr. (Daphnia magna, 24 h)
OECD 202, Acute Immobility, Environmental Agency of Japan 1999
1.1 mg/ltr. (Daphnia magna)
21 days, OECD 211 Reproduction Inhibition Test,
Environmental Agency of Japan 1999
> 4.8 mg/ltr. (Daphnia magna, 48h)
OECD 202, Acute Immobility, Environmental Agency of Japan 1999
> 5 mg/ltr. (Selenastrum capricornutum 72 h)
OECD 201, Nominal concentration, Growth Inhibition Test, Biomass, Test Environmental Agency of Japan 1999
> 5 mg/ltr. (Selenastrum capricornutum 72 h)
OECD 201, Nominal concentration, Growth Inhibition
<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50</td>
<td>1.0 mg/ltr. (Daphnia magna)</td>
</tr>
<tr>
<td></td>
<td>21 days, OECD 211 Reproduction Inhibition Test, Environmental Agency of Japan 1999</td>
</tr>
<tr>
<td></td>
<td>&gt; 500 mg/ltr. (Oryzias latipes 48 h)</td>
</tr>
<tr>
<td></td>
<td>&gt; 5 mg/ltr. (Oryzias latipes Rice fish 24 h)</td>
</tr>
<tr>
<td></td>
<td>OECD 203, Nominal concentration, Environmental Agency of Japan 1999</td>
</tr>
<tr>
<td></td>
<td>&gt; 5 mg/ltr. (Oryzias latipes Rice fish 96 h)</td>
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<tr>
<td></td>
<td>OECD 203, Nominal concentration, Environmental Agency of Japan 1999</td>
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<tr>
<td>LOEC</td>
<td>0.89 mg/ltr. (Daphnia magna)</td>
</tr>
<tr>
<td></td>
<td>21 days, OECD 211 Reproduction Inhibition Test, Environmental Agency of Japan 1999</td>
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<tr>
<td>NOEC</td>
<td>0.34 mg/ltr. (Daphnia magna)</td>
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<td></td>
<td>21 days, OECD 211 Reproduction Inhibition Test, Environmental Agency of Japan 1999</td>
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<tr>
<td></td>
<td>0.74 mg/ltr. (Daphnia magna, 48h)</td>
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<tr>
<td></td>
<td>OECD 202, Acute Immobility, Environmental Agency of Japan 1999</td>
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<tr>
<td></td>
<td>5 mg/ltr. (Oryzias latipes Rice fish 96 h)</td>
</tr>
<tr>
<td></td>
<td>OECD 203, Environmental Agency of Japan 1999</td>
</tr>
<tr>
<td></td>
<td>0.63 mg/ltr. (Selenastrum capricornutum 72 h)</td>
</tr>
<tr>
<td></td>
<td>OECD 201, Nominal concentration, Growth Inhibition Test, Biomass, Test Environmental Agency of Japan 1999</td>
</tr>
<tr>
<td>Persistence and degradability</td>
<td>MITI Test I, OECD 301 C</td>
</tr>
<tr>
<td>Degree of elimination</td>
<td>0 %, 28 d</td>
</tr>
<tr>
<td>Classification</td>
<td>Not readily biodegradable.</td>
</tr>
<tr>
<td>Behaviour in environmental systems:</td>
<td>The bioaccumulation potential is considered to be negligible</td>
</tr>
<tr>
<td>Bioaccumulative potential</td>
<td>Log P o/w : 6.25 Shaking Flask</td>
</tr>
<tr>
<td></td>
<td>BCF : (8weeks) 23-37 (1mg/l), 60-125 (0.1mg/l), Cyprin.carpio OECD SIDS</td>
</tr>
<tr>
<td></td>
<td>Koc : 1.5 x 105 OECD SIDS, calculated, no mobility in soil.</td>
</tr>
<tr>
<td></td>
<td>Henry constant : 7.9x10-12 atm-m3/mol, OECD SIDS, calculated</td>
</tr>
<tr>
<td></td>
<td>volatilization shouldn´t occur</td>
</tr>
<tr>
<td>General notes:</td>
<td>Do not allow product to reach ground water, water course or sewage system.</td>
</tr>
<tr>
<td></td>
<td>Water hazard class 1 (Self-assessment): slightly hazardous for water ( Germany )</td>
</tr>
<tr>
<td></td>
<td>According to appendix 3 VwVwS</td>
</tr>
<tr>
<td>Results of PBT and vPvB assessment</td>
<td>PBT: Not applicable; vPvB: Not applicable.</td>
</tr>
</tbody>
</table>
13. DISPOSAL CONSIDERATIONS

Waste treatment recommendation
Disposal considering to the local / regional / national / international regulations. Details have to be arranged with the authority concerned and / or the local waste management enterprise.

Waste disposal key
Depending on the application intended by the consumer, the allocation of waste codes according to the European waste catalogue has to be carried out in agreement with the waste disposal company and the authority.

Uncleaned packaging recommendation
Packaging may be reused or recycled after cleaning. Packagings that may not be cleansed are to be disposed of in the same manner as the product.

Recommended cleansing agents
Water, if necessary together with cleansing agents.

14. TRANSPORT INFORMATION

Land transport ADR/RID (cross-border)
ADR/RID class -
Maritime transport IMDG:
IMDG Class -
Marine pollutant No
Air transport ICAO-TI and IATA-DGR:
ICAO/IATA Class -
UN “Model Regulation” -
Special precautions for user Not applicable.
Transport/Additional information Not dangerous according to the above specifications.

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture
TSCA (Toxic Substances Control Act):
119-47-1 2, 2’-Methylene bis(4-methyl-6-tert-butylphenol) yes
119-47-1 2, 2’-Methylene bis(4-methyl-6-tert-butylphenol) FDA Food Approval
§ 175.105, § 175.350, § 176.200,
§ 177.1210, § 177.1240, § 177.1390,
§ 177.1395, § 177.1400,
§ 177.1550, § 177.1630, § 177.2260,
§ 177.2470, § 177.2480,
119-47-1  2,2'-Methylenbis(4-methyl-6-tert-butylphenol)

IECSC Chinese Chemical Inventory of Existing Chemical Substances
119-47-1  2,2'-Methylenbis(4-methyl-6-tert-butylphenol)

Australian Inventory of Chemical Substances
119-47-1  2,2'-Methylenbis(4-methyl-6-tert-butylphenol)

SWISS
119-47-1  2,2'-Methylenbis(4-methyl-6-tert-butylphenol)  yes, G-7456, List

Japan, ENCS Existing and New Chemical Substance List
119-47-1  2,2'-Methylenbis(4-methyl-6-tert-butylphenol)  4-100

Korea, KECI Korean Existing Chemical Inventory Korea
119-47-1  2,2'-Methylenbis(4-methyl-6-tert-butylphenol) KE-23821

Israel, IHSL, Proposed Israel Hazardous Substances List  Substance is not listed.

TTCSL, Proposed Taiwan Toxic Chemical Substances List  Substance is not listed.

IARC (International Agency for the Research on Cancer)  Substance is not listed.

DSL Domestic Substances List, NDSL Non-Domestic Substances List
119-47-1  2,2'-Methylenbis(4-methyl-6-tert-butylphenol)  yes, 3374

Philippines Inventory of Chemicals and Chemical Substances
119-47-1  2,2'-Methylenbis(4-methyl-6-tert-butylphenol)


NZIoC, New Zealand Inventory of Chemicals
119-47-1  2,2'-Methylenbis(4-methyl-6-tert-butylphenol) KE-23821

Labelling according to Regulation (EC) No 1272/2008
The substance is classified and labelled according to the CLP regulation.

Hazard pictograms  GHS08
Signal word  Warning

Hazard-determining components of labelling  2,2'-Methylenbis(4-methyl-6-tert-butylphenol)

Hazard statements
H361 Suspected of damaging fertility or the unborn child.  
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P273 Avoid release to the environment.  
P281 Use personal protective equipment as required.  
P220 Keep away from alkaline solutions.  
P220 Keep away from oxidising agents and acidic substances.  
P309 IF exposed or if you feel unwell:  
P313 Get medical advice/attention.  
P401 Store in accordance with local / regional / national / international regulations.  
P410 Protect from sunlight.  
P403 Store in a well-ventilated place.  
P402+P404 Store in a dry place. Store in a closed container.  
P501 Dispose of contents/container in accordance with local / regional / national / international regulations.

National regulations:
Information about limitation of use  Employment restrictions concerning pregnant and
lactating women must be observed. Employment restrictions concerning juveniles must be observed.

Breakdown regulations
Breakdown Directive: Not Part of Annex 1 (German Regulation)

Technical instructions (air):
Paragraph / Class: 5,2,1

Other regulations, limitations and prohibitive regulations
BG-Device: (Germany) Consider BG-device "Static electrification" (Germany)
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.
Department issuing MSDS: Chemical division/Health and safety department

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

16. OTHER INFORMATION

Other information: Further product information see under technical data sheet. This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

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