1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifiers

Product Name: Doxorubicin hydrochloride
Catalog Number: 2252
CAS Number: 25316-40-9  EC Number: 246-818-3
IUPAC Name: 10-[(3-Amino-2,3,6-trideoxy-α-L-lyxohexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-8-(hydroxyacetyl)-5,12-naphthacenedione hydrochloride

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

Identified Uses: Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company: Tocris Bioscience
The Watkins Building, Atlantic Road, Bristol, BS11 9QD, UK
Telephone: + 44 (0)117 916-3333
Fax: + 44 (0)117 916-3344
Internet: www.tocris.com
E-mail address: info@bio-techne.com

1.4 Emergency Telephone number

Emergency Tel: + 44 (0)117 916-3333 (09.00 - 17.00 GMT)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [GHS/CLP]
Germ cell mutagenicity - Category 1B
Carcinogenicity - Category 1B
Reproductive Toxicity - Category 1B

2.2 Label elements

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

Pictogram(s):

Signal word: Danger
Hazard statement(s):
H340 May cause genetic defects
H350 May cause cancer
H360 May damage fertility or the unborn child
Precautionary statement(s):
P280 Wear protective gloves/protective clothing/eye protection/face protection
P308+313 If exposed or concerned: Get medical advice/attention

2.3 Other hazards - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Product Name: Doxorubicin hydrochloride
Synonyms: Adriamycin, NSC 123127
Formula: C_{29}H_{29}NO_{11}.HCl  Molecular Weight: 579.99
CAS Number: 25316-40-9  EC Number: 246-818-3

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a doctor and show this safety data sheet.

If inhaled
Remove to fresh air and monitor breathing. If breathing becomes difficult, give oxygen. If breathing stops, give artificial respiration. Consult a doctor.

In case of skin contact
Immediately wash skin with copious amounts of soap and water for at least 15 minutes. Remove contaminated clothing and shoes and wash before reuse. Consult a doctor.

In case of eye contact
Flush with copious amounts of water for at least 15 minutes. Consult a doctor.

If swallowed
Rinse mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Consult a doctor.

4.2 Most important symptoms and effects, both acute and delayed
To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated.

4.3 Indication of immediate medical attention and special treatment needed
Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media
Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
In combustion, may emit toxic fumes.

5.3 Precautions for fire-fighters
Wear suitable protective clothing to prevent contact with skin and eyes and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Do not take action without suitable protective clothing - see section 8 of SDS. Evacuate personnel to safe areas. Ensure adequate ventilation. Avoid breathing vapors, mist, dust or gas.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Cover spillage with suitable absorbent material. Sweep up material and place in an appropriate container. Hold all material for appropriate disposal as described under section 13 of SDS.

6.4 Reference to other sections
For required PPE see section 8. For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Use in a chemical fume hood, with air supplied by an independent system. Avoid inhalation, contact with eyes, skin and clothing. Avoid the formation of dust and aerosols. Use in a well-ventilated area. Keep away from sources of ignition. Avoid prolonged or repeated exposure.

7.2 Conditions for safe storage, including any incompatibilities.
Store in cool, well-ventilated area. Keep away from direct sunlight. Keep container tightly sealed until ready for use. Recommended storage temperature: Desiccate at RT

7.3 Specific end uses
Use in a laboratory fume hood where possible. Refer to employer's COSHH risk assessment.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls
Appropriate engineering controls
Use in a fume hood where applicable. Ensure all engineering measures described under section 7 of SDS are in place. Ensure laboratory is equipped with a safety shower and eye wash station.

Personal protective equipment

Eye/face protection
Use appropriate safety glasses.

Skin protection
Use appropriate chemical resistant gloves (minimum requirement use standard BS EN 374:2003). Gloves should be inspected before use. Wash and dry hands thoroughly after handling.

Body protection
Wear appropriate protective clothing.
Respiratory protection
If risk assessment indicates necessary, use a suitable respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

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<tr>
<th>Appearance</th>
<th>Orange solid</th>
<th>Vapor pressure</th>
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<tbody>
<tr>
<td>Odor</td>
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<td>Vapor density</td>
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<tr>
<td>Odor threshold</td>
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<td>Relative density</td>
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</tr>
<tr>
<td>pH</td>
<td>No data available</td>
<td>Solubility(ies)</td>
<td>Soluble to 50 mM in water and to 50 mM in DMSO</td>
</tr>
<tr>
<td>Melting / freezing point</td>
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<td>Partition coefficient</td>
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</tr>
<tr>
<td>Boiling point / range</td>
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<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>No data available</td>
<td>Decomposition temperature</td>
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</tr>
<tr>
<td>Evaporation rate</td>
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<td>Viscosity</td>
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<td>Explosive properties</td>
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</tr>
<tr>
<td>Upper / lower flammability or explosive limits</td>
<td>No data available</td>
<td>Oxidising properties</td>
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</tr>
</tbody>
</table>

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
Stable under recommended transport or storage conditions.

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Hazardous reactions will not occur under normal transport or storage conditions. Decomposition may occur on exposure to conditions or materials listed below.

10.4 Conditions to avoid
Heat, moisture.

10.5 Incompatible materials
Strong acids/alkalis, strong oxidising/reducing agents.

10.6 Hazardous decomposition products
In combustion may emit toxic fumes. No known decomposition information.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute Toxicity
IPR-RAT LD50: 16030µg/kg; SCU-RAT LD50: 21840µg/kg; IVN-RAT LD50: 12510µg/kg; IMS-RAT LD50: 16mg/kg; ORL-MUS LD50: 698mg/kg; IPR-MUS LD50: 11160µg/kg; SCU-MUS LD50: 7678µg/kg; IMS-MUS LD50: 13700µg/kg; IVN-RBT LD50: 5980µg/kg.

Skin corrosion/irritation
Classified based on available data

Serious eye damage/irritation
Classified based on available data

Respiratory or skin sensitization
Classified based on available data

Germ cell mutagenicity
Classified based on available data

Carcinogenicity
Classified based on available data

Reproductive toxicity
Classified based on available data

Specific target organ toxicity - single exposure
Classified based on available data

Specific target organ toxicity - repeated exposure
Classified based on available data

Aspiration hazard
Classified based on available data

Symptoms / Routes of exposure
Inhalation: There may be irritation of the throat with a feeling of tightness in the chest.
Ingestion: There may be irritation of the throat.
Skin: There may be mild irritation at the site of contact.
Eyes: There may be irritation and redness.

Delayed / Immediate Effects: No known symptoms.

**Additional Information**
RTECS No: QI9295900
Exposure may cause irritation of eyes, mucous membranes, upper respiratory tract and skin.
To the best of our knowledge, the chemical, physical and toxicological properties have not been fully investigated

12. **ECOLOGICAL INFORMATION**

12.1 **Toxicity**
No data available

12.2 **Persistence and degradability**
No data available

12.3 **Bioaccumulative potential**
No data available

12.4 **Mobility in soil**
No data available

12.5 **Results of PBT and vPvB assessment**
No data available

12.6 **Other adverse effects**
No data available

13. **DISPOSAL CONSIDERATIONS**

13.1 **Waste treatment methods**
- **Product**
  Transfer to a suitable container and arrange for collection by specialized disposal company in accordance with National legislation.
- **Contaminated packaging**
  Dispose of in a regulated landfill site or other method for hazardous or toxic wastes in accordance with National legislation.

14. **TRANSPORT INFORMATION**

Classified according to the criteria of the UN Model Regulations as reflected in the IMDG Code, ADR, RID and IATA.

14.1 **UN-Number**
Does not meet the criteria for classification as hazardous for transport.

14.2 **UN proper shipping name**
Does not meet the criteria for classification as hazardous for transport.

14.3 **Transport hazard class(es)**
Does not meet the criteria for classification as hazardous for transport.

14.4 **Packaging group**
Does not meet the criteria for classification as hazardous for transport.

14.5 **Environmental hazards**
This product is not classified as environmentally hazardous according to the UN Model Regulations, nor a marine pollutant according to the IMDG Code.

14.6 **Special precautions for users**
No data available

15. **REGULATORY INFORMATION**

This safety datasheet complies with the requirements of Regulation (EC) No. 453/2010.

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

**California Proposition 65**

WARNING: This product can expose you to Doxorubicin hydrochloride, which is known to the State of California to cause cancer. For more information go to. [www.P65Warnings.ca.gov/product](http://www.P65Warnings.ca.gov/product)

WARNING: This product can expose you to Doxorubicin hydrochloride, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to. [www.P65Warnings.ca.gov/product](http://www.P65Warnings.ca.gov/product)

Date Listed
Jul 1st 1987
Jan 29th 1999

15.2 **Chemical safety assessment**
16. OTHER INFORMATION

Further Information
Copyright © 2019 Tocris Bioscience. This company shall not be held liable for any damage resulting from handling or from contact with the above product. This material must only be handled by suitably qualified experienced scientists in appropriately equipped and authorized facilities. The above information is believed to be correct but does not purport to be all inclusive and should be used as a guide only for experienced personnel. Always consult your safety advisor and follow appropriate local and national safety legislature. The absence of warning must not, under any circumstance, be taken to mean that no hazard exists.

End of safety data sheet