



# SAFETY DATA SHEET

United States

## Section 1. Identification

Product name

**NHS; part of 'Thiol Coupling Kit'**

Catalogue Number

**BR100557**



Other means of identification

Not available.

Product type

Solid.

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

#### Identified uses

Analytical chemistry.  
Laboratory chemicals  
Scientific research and development  
Consumer use

-

Supplier

Cytiva  
Amersham Place  
Little Chalfont  
Buckinghamshire  
HP7 9NA United Kingdom  
+44 1494 508000

Cytiva USA  
100 Results Way  
Marlborough, MA 01752  
1-800-526-3593

In case of emergency

INFOTRAC - 24 Hour number: 1-800-535-5053  
Outside of the United States, call 24 Hour number: 001-352-323-3500 (Call Collect)

## Section 2. Hazards identification

OSHA/HCS status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture

ACUTE TOXICITY (oral) - Category 4  
SKIN IRRITATION - Category 2  
EYE IRRITATION - Category 2A  
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3

### GHS label elements

Hazard pictograms



Signal word

Warning

Hazard statements

Harmful if swallowed.  
Causes skin irritation.  
Causes serious eye irritation.  
May cause respiratory irritation.

### Precautionary statements

Prevention

Wear protective gloves. Wear eye or face protection. Use only outdoors or in a well-ventilated area. Avoid breathing dust. Do not eat, drink or smoke when using this product. Wash thoroughly after handling.



|   |   |
|---|---|
| <b>Response</b>                         | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor if you feel unwell. IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. Rinse mouth. IF ON SKIN: Wash with plenty of water. If skin irritation occurs: Get medical advice or attention. Take off contaminated clothing and wash it before reuse. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice or attention. |
| <b>Storage</b>                          | Store locked up. Store in a well-ventilated place. Keep container tightly closed.   |
| <b>Disposal</b>                         | Dispose of contents and container in accordance with all local, regional, national and international regulations.   |
| <b>Hazards not otherwise classified</b> | None known.   |
| <b>Hazards identified when used</b>     | No known significant effects or critical hazards.   |

### Section 3. Composition/information on ingredients

|                               |   |     |                |
|-------------------------------|---|-----|----------------|
| Substance/mixture             | Substance   |     |                |
| Other means of identification | Not available.  |     |                |
| Ingredient name               | Synonyms  | %   | Identifiers    |
| N-hydroxysuccinimide          | 2,5-Pyrrolidinedione, 1-hydroxy-; N-Hydroxysuccinamide;<br>1-Hydroxypyrrolidine-2,5-dione;<br>Hydroxysuccinimide; SUCCINIMIDE, N-HYDROXY- | 100 | CAS: 6066-82-6 |

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

**There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.**

**Occupational exposure limits, if available, are listed in Section 8.**

### Section 4. First aid measures

#### Description of necessary first aid measures

|                     |   |
|---------------------|---|
| <b>Eye contact</b>  | Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.   |
| <b>Inhalation</b>   | Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. |
| <b>Skin contact</b> | Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.  |
| <b>Ingestion</b>    | Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.   |

#### Most important symptoms/effects, acute and delayed

##### Potential acute health effects

|                     |                                   |
|---------------------|-----------------------------------|
| <b>Eye contact</b>  | Causes serious eye irritation.    |
| <b>Inhalation</b>   | May cause respiratory irritation. |
| <b>Skin contact</b> | Causes skin irritation.           |
| <b>Ingestion</b>    | Harmful if swallowed.             |

##### Over-exposure signs/symptoms

|                     |  |
|---------------------|--|
| <b>Eye contact</b>  | Adverse symptoms may include the following:<br>pain or irritation<br>watering<br>redness |
| <b>Inhalation</b>   | Adverse symptoms may include the following:<br>respiratory tract irritation<br>coughing  |
| <b>Skin contact</b> | Adverse symptoms may include the following:<br>irritation<br>redness                     |
| <b>Ingestion</b>    | No specific data.  |



**Indication of immediate medical attention and special treatment needed, if necessary**

|                                   |  |
|-----------------------------------|--|
| <b>Notes to physician</b>         | In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.  |
| <b>Specific treatments</b>        | No specific treatment.   |
| <b>Protection of first-aiders</b> | No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. |

See toxicological information (Section 11)

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**Section 5. Fire-fighting measures****Extinguishing media**

|   |   |
|---|---|
| <b>Suitable extinguishing media</b>                   | Use an extinguishing agent suitable for the surrounding fire.   |
| <b>Unsuitable extinguishing media</b>                 | None known.   |
| <b>Specific hazards arising from the chemical</b>     | No specific fire or explosion hazard.   |
| <b>Hazardous thermal decomposition products</b>       | Decomposition products may include the following materials:<br>carbon dioxide<br>carbon monoxide<br>nitrogen oxides   |
| <b>Special protective actions for fire-fighters</b>   | Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. |
| <b>Special protective equipment for fire-fighters</b> | Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.                         |

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**Section 6. Accidental release measures****Personal precautions, protective equipment and emergency procedures**

|                                    |   |
|------------------------------------|---|
| <b>For non-emergency personnel</b> | No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment. |
| <b>For emergency responders</b>    | If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".   |
| <b>Environmental precautions</b>   | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).   |

**Methods and materials for containment and cleaning up**

|                    |  |
|--------------------|--|
| <b>Small spill</b> | Move containers from spill area. Avoid dust generation. Using a vacuum with HEPA filter will reduce dust dispersal. Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.  |
| <b>Large spill</b> | Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor. |

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**Section 7. Handling and storage****Precautions for safe handling**

|   |  |
|---|--|
| <b>Protective measures</b>  | Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.   |
| <b>Advice on general occupational hygiene</b>                       | Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.  |
| <b>Conditions for safe storage, including any incompatibilities</b> | Do not store below the following temperature: 15°C (59°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use. |

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## Section 8. Exposure controls/personal protection

### Control parameters

#### Occupational exposure limits

##### Ingredient name

N-hydroxysuccinimide

##### Exposure limits

None.

#### Biological exposure indices

No exposure indices known.

#### Appropriate engineering controls

Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

#### Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

### Individual protection measures

#### Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

#### Eye/face protection

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

#### Skin protection

##### Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

##### Body protection

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

##### Other skin protection

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

#### Respiratory protection

Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

## Section 9. Physical and chemical properties

### Appearance

|  |  |
|--|--|
| Physical state   | Solid.   |
| Color  | White.   |
| Odor   | Odorless.  |
| Odor threshold   | Not available.   |
| pH   | Not available.   |
| Melting point/freezing point                             | 92 to 93°C (197.6 to 199.4°F)                                    |
| Boiling point or initial boiling point and boiling range | Not available.   |
| Flash point  | Closed cup: 175°C (347°F) [Product does not sustain combustion.] |
| Burning time   | Not available.   |
| Burning rate   | Not available.   |
| Evaporation rate   | Not available.   |
| Flammability   | Not available.   |
| Lower and upper explosive (flammable) limits             | Not applicable.  |
| Vapor pressure   | Not available.   |
| Relative vapor density                                   | Not applicable.  |
| Relative density   | Not available.   |
| Solubility(ies)  |  |

#### Media

cold water  
hot water

#### Result

Easily soluble  
Easily soluble



|  |  |
|--|--|
| <b>Solubility in water</b>                         | Not available.   |
| <b>Partition coefficient: n-octanol/<br/>water</b> | Not applicable.  |
| <b>Auto-ignition temperature</b>                   | Not applicable.  |
| <b>Decomposition temperature</b>                   | 175°C (347°F)  |
| <b>SADT</b>  | Not available.   |
| <b>Viscosity</b>                                   | Dynamic (room temperature): Not available.<br>Kinematic (room temperature): Not available.<br>Kinematic (40°C (104°F)): Not available. |
| <b>Flow time (ISO 2431)</b>                        | Not available.   |
| <b><u>Particle characteristics</u></b>             |  |
| <b>Median particle size</b>                        | Not available.   |

## Section 10. Stability and reactivity

|   |  |
|---|--|
| <b>Reactivity</b>                             | No specific test data related to reactivity available for this product or its ingredients.           |
| <b>Chemical stability</b>                     | The product is stable.   |
| <b>Possibility of hazardous<br/>reactions</b> | Under normal conditions of storage and use, hazardous reactions will not occur.                      |
| <b>Conditions to avoid</b>                    | No specific data.  |
| <b>Incompatible materials</b>                 | No specific data.  |
| <b>Hazardous decomposition<br/>products</b>   | Under normal conditions of storage and use, hazardous decomposition products should not be produced. |

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

Not available.

|   |                |
|---|----------------|
| <b>Conclusion/Summary<br/>[Product]</b> | Not available. |
|---|----------------|

#### Skin corrosion/irritation

Not available.

|   |                |
|---|----------------|
| <b>Conclusion/Summary<br/>[Product]</b> | Not available. |
|---|----------------|

#### Serious eye damage/eye irritation

Not available.

|   |                |
|---|----------------|
| <b>Conclusion/Summary<br/>[Product]</b> | Not available. |
|---|----------------|

#### Respiratory corrosion/irritation

Not available.

|   |                |
|---|----------------|
| <b>Conclusion/Summary<br/>[Product]</b> | Not available. |
|---|----------------|

#### Respiratory or skin sensitization

Not available.

#### **Skin**

|   |                |
|---|----------------|
| <b>Conclusion/Summary<br/>[Product]</b> | Not available. |
|---|----------------|

#### **Respiratory**

|   |                |
|---|----------------|
| <b>Conclusion/Summary<br/>[Product]</b> | Not available. |
|---|----------------|

#### Germ cell mutagenicity



Not available.

**Conclusion/Summary  
[Product]** Not available.

#### **Carcinogenicity**

Not available.

**Conclusion/Summary  
[Product]** Not available.

#### **Reproductive toxicity**

Not available.

**Conclusion/Summary  
[Product]** Not available.

#### **Specific target organ toxicity (single exposure)**

**Product/ingredient name**

N-hydroxysuccinimide

**Result**

SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE)  
(Respiratory tract irritation) - Category 3

#### **Specific target organ toxicity (repeated exposure)**

Not available.

#### **Aspiration hazard**

Not available.

**Information on the likely routes  
of exposure** Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

#### **Potential acute health effects**

|                     |                                   |
|---------------------|-----------------------------------|
| <b>Eye contact</b>  | Causes serious eye irritation.    |
| <b>Inhalation</b>   | May cause respiratory irritation. |
| <b>Skin contact</b> | Causes skin irritation.           |
| <b>Ingestion</b>    | Harmful if swallowed.             |

#### **Symptoms related to the physical, chemical and toxicological characteristics**

|                     |  |
|---------------------|--|
| <b>Eye contact</b>  | Adverse symptoms may include the following:<br>pain or irritation<br>watering<br>redness |
| <b>Inhalation</b>   | Adverse symptoms may include the following:<br>respiratory tract irritation<br>coughing  |
| <b>Skin contact</b> | Adverse symptoms may include the following:<br>irritation<br>redness                     |
| <b>Ingestion</b>    | No specific data.  |

#### **Delayed and immediate effects and also chronic effects from short and long term exposure**

##### **Short term exposure**

|                                    |                |
|------------------------------------|----------------|
| <b>Potential immediate effects</b> | Not available. |
| <b>Potential delayed effects</b>   | Not available. |

##### **Long term exposure**

|                                    |                |
|------------------------------------|----------------|
| <b>Potential immediate effects</b> | Not available. |
| <b>Potential delayed effects</b>   | Not available. |

#### **Potential chronic health effects**

Not available.



**Conclusion/Summary  
[Product]** Not available.

**General** No known significant effects or critical hazards.  
**Carcinogenicity** No known significant effects or critical hazards.  
**Mutagenicity** No known significant effects or critical hazards.  
**Reproductive toxicity** No known significant effects or critical hazards.

#### **Numerical measures of toxicity**

##### **Acute toxicity estimates**

| Product/ingredient name           | Oral (mg/kg) | Dermal (mg/kg) | Inhalation (gases) (ppm) | Inhalation (vapors) (mg/l) | Inhalation (dusts and mists) (mg/l) |
|-----------------------------------|--------------|----------------|--------------------------|----------------------------|-------------------------------------|
| NHS; part of 'Thiol Coupling Kit' | 500          | N/A            | N/A                      | N/A                        | N/A                                 |
| N-hydroxysuccinimide              | 500          | N/A            | N/A                      | N/A                        | N/A                                 |

## Section 12. Ecological information

### **Toxicity**

Not available.

**Conclusion/Summary  
[Product]** Not available.

### **Persistence and degradability**

Not available.

### **Bioaccumulative potential**

Not available.

### **Mobility in soil**

**Soil/Water partition coefficient** Not available.

**Other adverse effects** No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14. Transport information

**Product is not regulated as dangerous goods for transport.**

## Section 15. Regulatory information

**U.S. Federal regulations** TSCA 8(a) CDR Exempt/Partial exemption: Not determined

### **TSCA 12(b) - Chemical export notification**

Not applicable.

|   |            |
|---|------------|
| <b>Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)</b> | Not listed |
| <b>Clean Air Act Section 602 Class I Substances</b>                 | Not listed |
| <b>Clean Air Act Section 602 Class II Substances</b>                | Not listed |
| <b>DEA List I Chemicals (Precursor Chemicals)</b>                   | Not listed |
| <b>DEA List II Chemicals (Essential Chemicals)</b>                  | Not listed |

### **SARA 302/304**



**Composition/information on ingredients**

No products were found.

**SARA 304 RQ** Not applicable.**SARA 311/312**

**Classification**

ACUTE TOXICITY (oral) - Category 4  
SKIN IRRITATION - Category 2  
EYE IRRITATION - Category 2A  
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3

**Composition/information on ingredients**

| Name                 | %   | Classification   |
|----------------------|-----|--|
| N-hydroxysuccinimide | 100 | ACUTE TOXICITY (oral) - Category 4<br>SKIN IRRITATION - Category 2<br>EYE IRRITATION - Category 2A<br>SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 |

**State regulations**

**Massachusetts** None of the components are listed.  
**New York** None of the components are listed.  
**New Jersey** None of the components are listed.  
**Pennsylvania** None of the components are listed.

**California Prop. 65**

This product does not require a Safe Harbor warning under California Prop. 65.

**International regulations****Chemical Weapon Convention List Schedules I, II & III Chemicals**

Not listed.

**Montreal Protocol**

Not listed.

**Stockholm Convention on Persistent Organic Pollutants**

Not listed.

**Rotterdam Convention on Prior Informed Consent (PIC)**

Not listed.

**UNECE Aarhus Protocol on POPs and Heavy Metals**

Not listed.

**Inventory list**

**United States** All components are active or exempted.  
**Canada inventory** All components are listed or exempted.

**Section 16. Other information****National Fire Protection Association (U.S.A.)****Procedure used to derive the classification**

| Classification   | Justification      |
|--|--------------------|
| ACUTE TOXICITY (oral) - Category 4   | Calculation method |
| SKIN IRRITATION - Category 2   | Calculation method |
| EYE IRRITATION - Category 2A   | Calculation method |
| SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 | Calculation method |

**History**

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sds\_author@cytiva.com**Key to abbreviations**

ATE = Acute Toxicity Estimate  
BCF = Bioconcentration Factor  
GHS = Globally Harmonized System of Classification and Labelling of Chemicals  
IATA = International Air Transport Association  
IBC = Intermediate Bulk Container  
IMDG = International Maritime Dangerous Goods  
LogPow = logarithm of the octanol/water partition coefficient  
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)  
N/A = Not available  
UN = United Nations  
Not available.

**References**

▀ Indicates information that has changed from previously issued version.

**Notice to reader**

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

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