



SAFETY DATA SHEET

1. IDENTIFICATION OF THE PRODUCT AND THE COMPANY

1.1 Product name : Substrate TH1
 1.2 Product codes : 081-03; 081-31; 081-32
 1.3 Manufacturer : PENTAPHARM LTD.
 Engelgasse 109
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2. COMPOSITION AND INFORMATION ON INGREDIENTS

2.1 Chemical characterisation : H-(D)-CHG-Ala-Arg-pNA.2AcOH
 Name : D-Cyclohexylglycyl-alanyl-arginine-paranitroanilide diacetate salt

2.2 Hazardous ingredients : para-nitroaniline
 2.3 CAS-No. : 100-01-6 (para-nitroaniline)
 2.4 EINECS-No. : 202-810-1 (para-nitroaniline)

3. HAZARD IDENTIFICATION

To our knowledge the health hazards for the intact compound have not been thoroughly investigated.

Free para-nitroaniline is a toxic substance which, at a maximum concentration of 1 ppm in the working place, exerts negative effects already in small quantities. Although free para-nitroaniline represents the toxic constituent of the compounds it cannot be excluded to not have toxic properties also when bound to a peptide.

However, it has to be noted that the para-nitroaniline concentration in the chromogenic substrate is so low that para-nitroaniline released during a total conversion of the substrate is still dissolved in the aqueous solution. Chromogenic substrates are per se not volatile. With a boiling point of 332°C it has not to be feared that it is unlikely that para-nitroaniline will be present in the gaseous or vapor phase.

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4. FIRST AID MEASURES

- 4.1 Skin Contact : Flush with plenty of water for several minutes.
- 4.2 Eye Contact : Flush immediately with plenty of water.
- 4.3 Inhalation : Immediately give oxygen.
- 4.4 Ingestion : Immediately give plenty of water to drink and induce vomiting.
- 4.5 Other first aid information : After inhalation apply oxygen immediately, if required perform symptomatic treatment. After absorption of the substance, immediately drink plenty of water and seek medical advise.

5. FIRE FIGHTING MEASURES

- 5.1 Extinguishing media : Fire class A extinguishers, eye-rinsing devices
- 5.2 Unsuitable extinguishing media : None known
- 5.3 Unusual fire fighting hazards : None known
- 5.4 Special fire fighting procedure : None known
- 5.5 Other recommendations : Use approved self-contained breathing apparatus and protective clothing.

6. ACCIDENTAL RELEASE MEASURES

- 6.1 Personal precautions : Immediately clean contaminated clothes.
- 6.2 Precautions to protect the environment : None
- 6.3 Cleanup procedures : Free para-nitroaniline, as poorly water-soluble needles, has to be dissolved in a non-flammable solvent before being destroyed by combustion.
Chromogenic proteinase substrates are completely soluble in water even after accomplished enzyme determination. We recommend to collect all the solution residues and to dispose of in the same way as organic solvents (combustion).



7. HANDLING AND STORAGE

- | | | |
|--------------------------|---|--|
| 7.1 Handling precautions | : | Avoid skin and eye contact and particle inhalation. |
| 7.2 Storage precautions | : | Store the product in a dry place protected from light at a temperature at 4-8°C. |
| 7.3 Other information | : | None |

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

- | | | |
|-----------------------------------|---|---|
| 8.1 Exposure controls | : | See 7.1 |
| 8.2 Engineering control measures | : | No special measure is required. |
| 8.3 Personal protective equipment | | |
| Respiratory protection | : | Face mask |
| Hand protection | : | Gloves |
| Eye protection | : | Safety glasses |
| Skin protection | : | No further protective clothing is required. |
| Other | : | --- |

9. PHYSICAL AND CHEMICAL PROPERTIES

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|---------------------------------------|---|--------------------|
| 9.1 Appearance | | |
| Physical state | : | Powder |
| Colour | : | Off-white |
| Odour | : | None |
| 9.2 Safety related information | | |
| pH | : | Not determined |
| Boiling point/boiling range | : | Not determined |
| Melting point/melting range | : | Not determined |
| Flash point | : | Not determined |
| Flammability (solid, gas) | : | Not determined |
| Autoflammability | : | Not determined |
| Explosive properties | : | Not applicable |
| Oxidizing properties | : | Not applicable |
| Vapour pressure | : | Not applicable |
| Relative density | : | Not applicable |
| Water solubility | : | Completely soluble |
| Fat solubility | : | Not determined |
| n-octanol/water partition coefficient | : | Not determined |
| Vapour density (air = 1) | : | Not determined |
| Viscosity | : | Not determined |
| Volatiles | : | Water, < 2% |



10. STABILITY AND REACTIVITY

10.1 Conditions to avoid	:	None known
10.2 Materials to avoid	:	None known
10.3 Hazardous decomposition products	:	para-nitroaniline

11. TOXICOLOGICAL INFORMATION

11.1 Possible dangerous-to-health effects		
Skin contact	:	Allergic reactions
Eye contact	:	Allergic reactions
Inhalation	:	Allergic reactions
Ingestion	:	Nitroaniline is an extremely potent poison for blood. Already in small quantities it leads to methemoglobin formation. Its effect is strongly increased by alcohol. Locally it causes severe irritations of skin and mucous membranes. Repeated contact with skin provokes dermatites. Oral absorption, inhalation of dust or skin resorption leads to headache, flushed face, respiratory troubles, nausea, vomiting, general weakness, tiredness, cyanosis and coma.
Other information	:	None

12. ECOLOGICAL INFORMATION

12.1 Mobility	:	Not determined
12.2 Persistence and degradability	:	Not determined
12.3 Bioaccumulative potential	:	Not determined
12.4 Ecotoxicity	:	Water-contaminating substance
12.5 Other information	:	None



13. DISPOSAL CONSIDERATIONS

- 13.1 Product disposal : Collect in steel containers.
- 13.2 Packaging disposal : Disposal according to the local and national legislation.

14. TRANSPORT INFORMATION

- 14.1 UN-No. : Not applicable
- 14.2 Road and rail transport : Not applicable
- 14.3 Air transport : Not applicable
- 14.4 Sea transport : Not applicable
- 14.5 Inland navigation : Not applicable
- 14.6 Other information : None

15. REGULATORY INFORMATION

- 15.1 Supply classification and labelling : Packing in glass containers, no special labelling requirements.
- 15.2 National legislation : For further product information, we recommend consideration of the corresponding appropriate national legislation.

16. OTHER INFORMATION

All information and instructions provided in this Safety Data Sheet are based on the current state of scientific and technical knowledge at the date indicated on this Safety Data Sheet. PENTAPHARM Ltd. shall not be held responsible for any defect in the product covered by this Safety Data Sheet, should the existence of such a defect not be detectable considering the current state of scientific and technical knowledge.

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