

# Product Information



## 4-hydroxy Nonenal Glutathione-d<sub>3</sub> (trifluoroacetate salt)

Item No. 9000876

**Formal Name:** L-γ-glutamyl-S-[(3S)-tetrahydro-5-hydroxy-2-pentyl-3-furanyl]-L-cysteinyl-glycine-11,11,11-d<sub>3</sub>, trifluoroacetate salt

**Synonym:** 4-HNE-GSH-d<sub>3</sub>

**MF:** C<sub>19</sub>H<sub>30</sub>D<sub>3</sub>N<sub>3</sub>O<sub>8</sub>S • CF<sub>3</sub>COOH

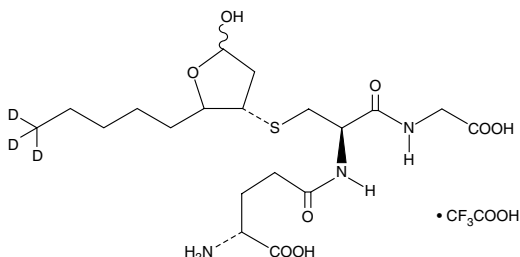
**FW:** 580.6

**Chemical Purity:** ≥95%

**Deuterium Incorporation:** ≥99% deuterated forms (d<sub>1</sub>-d<sub>3</sub>); ≤1% d<sub>0</sub>

**Stability:** ≥2 years at -20°C

**Supplied as:** A lyophilized powder



### Laboratory Procedures

4-hydroxy Nonenal Glutathione-d<sub>3</sub> (4-HNE-GSH-d<sub>3</sub> (trifluoroacetate salt)) contains three deuterium atoms at the terminal methyl position. It is intended for use as an internal standard for the quantification of 4-HNE-GSH (trifluoroacetate salt) by GC- or LC-mass spectrometry (MS). For long term storage, we suggest that 4-HNE-GSH-d<sub>3</sub> (trifluoroacetate salt) be stored as supplied at -20°C. It should be stable for at least two years.

4-HNE-GSH-d<sub>3</sub> (trifluoroacetate salt) is supplied as a lyophilized powder. For biological experiments, we suggest that organic solvent-free aqueous solutions of 4-HNE-GSH-d<sub>3</sub> (trifluoroacetate salt) be prepared by directly dissolving the lyophilized powder in water. The solubility of 4-HNE-GSH-d<sub>3</sub> (trifluoroacetate salt) in water is approximately 10 mg/ml. We do not recommend storing the aqueous solution for more than one day.

4-HNE-GSH-d<sub>3</sub> (trifluoroacetate salt) is used as an internal standard for the quantification of 4-HNE-GSH (trifluoroacetate salt) by stable isotope dilution MS. The accuracy of the sample weight in this vial is between 5% over and 2% under the amount shown on the vial. If better precision is required, the deuterated standard should be quantitated against a more precisely weighed unlabeled standard by constructing a standard curve of peak intensity ratios (deuterated *versus* unlabeled).

4-HNE is a major aldehyde produced during the lipid peroxidation of ω-6 polyunsaturated fatty acids, such as arachidonic acid and linoleic acid.<sup>1,2</sup> 4-HNE-GSH is a major adduct formed by the reaction of 4-HNE with GSH.<sup>3-6</sup> HNE-GSH levels in liver, plasma, or isolated cells can serve as biomarkers for oxidative stress.<sup>7</sup> The trapping of 4-HNE by glutathione to give HNE-GSH prevents the formation of DNA adducts with 4-HNE.<sup>8,9</sup> In human polymorphonuclear leukocytes, HNE-GSH is metabolized to 1,4-dihydroxynonene glutathione (DHN-GSH), 4-hydroxynonenoic acid glutathione (HNA-GSH), and 4-hydroxy nonenal mercapturic acid (HNE-MA).<sup>4</sup>

### References

1. Pryor, W.A. and Porter, N.A. *Free Radic. Biol. Med.* **8**, 541-543 (1990).
2. Esterbauer, H., Schaur, R.J., and Zollner, H. *Free Radic. Biol. Med.* **11**, 81-128 (1991).
3. Siems, W., Crifo, C., Capuozzo, E., *et al. Arch. Biochem. Biophys.* **503**, 248-252 (2010).
4. Laurent, A., Alary, J., Debrauwer, L., *et al. Chem. Res. Toxicol.* **12**, 887-894 (1999).
5. Siems, W. and Grune, T. *Mol. Aspects Med.* **24**, 167-175 (2003).
6. Alary, J., Fernandez, Y., Debrauwer, L., *et al. Chem. Res. Toxicol.* **16**, 320-327 (2003).
7. Völkel, W., Alvarez-Sánchez, R., Weick, I., *et al. Free Radic. Biol. Med.* **38**, 1526-1536 (2005).
8. Falletti, O. and Douki, T. *Chem. Res. Toxicol.* **21**(11), 2097-2105 (2008).
9. Falletti, O., Cadet, J., Favier, A., *et al. Free Radic. Biol. Med.* **42**, 1258-1269 (2007).

### Related Products

For a list of related products please visit: [www.caymanchem.com/catalog/9000876](http://www.caymanchem.com/catalog/9000876)

**WARNING: THIS PRODUCT IS FOR LABORATORY RESEARCH ONLY; NOT FOR ADMINISTRATION TO HUMANS. NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.**

#### MATERIAL SAFETY DATA

This material should be considered hazardous until information to the contrary becomes available. Do not ingest, swallow, or inhale. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. This information contains some, but not all, of the information required for the safe and proper use of this material. Before use, the user must review the complete Material Safety Data Sheet, which has been sent *via* email to your institution.

#### WARRANTY AND LIMITATION OF REMEDY

Cayman Chemical Company makes **no warranty or guarantee** of any kind, whether written or oral, expressed or implied, including without limitation, any warranty of fitness for a particular purpose, suitability and merchantability, which extends beyond the description of the chemicals hereof. Cayman **warrants only** to the original customer that the material will meet our specifications at the time of delivery.

Cayman will carry out its delivery obligations with due care and skill. Thus, in no event will Cayman have **any obligation or liability**, whether in tort (including negligence) or in contract, for any direct, indirect, incidental or consequential damages, even if Cayman is informed about their possible existence.

This limitation of liability does not apply in the case of intentional acts or negligence of Cayman, its directors or its employees.

Buyer's **exclusive remedy** and Cayman's sole liability hereunder shall be limited to a refund of the purchase price, or at Cayman's option, the replacement, at no cost to Buyer, of all material that does not meet our specifications.

Said refund or replacement is conditioned on Buyer giving written notice to Cayman within thirty (30) days after arrival of the material at its destination. Failure of Buyer to give said notice within thirty (30) days shall constitute a waiver by Buyer of all claims hereunder with respect to said material.

For further details, please refer to our **Warranty and Limitation of Remedy** located on our website and in our catalog.

Copyright Cayman Chemical Company, 07/30/2012

### Cayman Chemical

#### Mailing address

1180 E. Ellsworth Road  
Ann Arbor, MI  
48108 USA

#### Phone

(800) 364-9897  
(734) 971-3335

#### Fax

(734) 971-3640

#### E-Mail

[custserv@caymanchem.com](mailto:custserv@caymanchem.com)

#### Web

[www.caymanchem.com](http://www.caymanchem.com)