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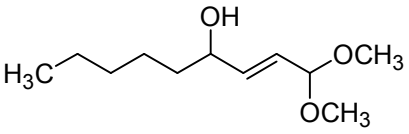
ProductInformation

HNE-DMA

Catalog Number **H9538**
Storage Temperature –20 °C

Synonyms: (E)-4-Hydroxynonenal-dimethyl acetal; (E)-4-Hydroxynonenal-DMA

Product Description
Molecular Formula: $C_{11}H_{22}O_3$
Molecular Weight: 202.29



HNE-DMA is the stable dimethyl acetal derivative of (E)-4-Hydroxynonenal (HNE). HNE-DMA may be used to prepare HNE in solution.

HNE is produced by the peroxidation of ω-6 fatty acids[1,2] and reacts with sulfhydryl, amino, and imidazole groups. It can be used as a marker of lipid peroxidation. HNE has diverse biological effects. HNE is a marker of oxidative stress,[3,4] possible causative agent in Alzheimer's[5] and atherosclerosis, inhibits growth modulating factor, and acts as a signaling molecule by inducing apoptosis. HNE forms an adduct with cell surface receptors leading to activation of RTKs and growth inhibition via a signaling cascade. HNE also modulates PP2A dephosphorylation of Akt, inhibits phosphorylation of IκB downregulating NF-κB responses, and inhibits induction of iNOS.

The product is supplied as a hexane solution.

Purity: ≥85% (GC)

Precautions and Disclaimer
This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions
To prepare HNE from HNE-DMA: evaporate the hexane under a gentle stream of nitrogen at room temperature. Working at 4 °C, add 1 ml (5 mg size) or 0.4 ml (2 mg size) of 1 mM cold HCl and stir for 45 minutes, or alternatively, close the vial and shake for 30 minutes. Upon hydrolysis, the initially cloudy solution becomes almost clear. This solution now has a pH of ~3, contains ~5 mg (5 mg size) or ~2 mg (2 mg size) of the aldehyde (HNE), and is stable for at least 24 hours if kept at 4 °C. It is recommended that the freshly prepared HNE solution be used immediately.

Note: If neutralized, this product is stable for 6 hours. HNE decomposes in basic solution within a few minutes. Never use alkali to neutralize the pH, rather use appropriately concentrated buffers. During hydrolysis, methanol is generated. If methanol is undesirable in the solution, HNE can be extracted into chloroform or dichloromethane. HNE is only sparingly soluble in water.

Storage/Stability
The HNE-DMA ships on dry ice and storage at –20 °C or below is recommended.

References

1. Pryor, W.A., and Porter, N.A., Suggested mechanisms for the production of 4-hydroxy-2-nonenal from the autoxidation of polyunsaturated fatty acids. *Free Radic. Biol. Med*., **8**, 541-543 (1990).
2. Esterbauer, H., *et al*., Chemistry and biochemistry of 4-hydroxy-2-nonenal, maloaldehyde and related aldehydes. *Free Radic. Biol. Med*., **11**, 81-128 (1991).
3. Liu, w., et al., Distinct involvement of NF-κB and p38 mitogen-activated protein kinase pathways in serum deprivation-mediated stimulation of inducible nitric oxide synthase and its inhibition by 4-hydroxynonenal. *J. Cell Biochem.* **83**, 271-280 (2001).
4. Hattori, Y., *et al*., 4-hydroxynonenal prevents NO production in vascular smooth muscle cells by inhibiting nuclear factor-kappaB-dependent transcriptional activation of inducible NO synthase. *Arterioscler. Thromb. Vasc. Biol*., **21**, 1179-1183 (2001).
5. Picklo, M.J., *et al*., Carbonyl toxicology and Alzheimer's disease. *Toxicol. Appl. Pharmacol*., **184**, 187-197 (2002).

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