

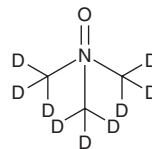
# PRODUCT INFORMATION



## Trimethylamine-d<sub>9</sub> N-oxide

Item No. 31449

**CAS Registry No.:** 1161070-49-0  
**Formal Name:** N,N-di(methyl-d<sub>3</sub>)-methan-d<sub>3</sub>-amine, N-oxide  
**Synonym:** TMAO-d<sub>9</sub>  
**MF:** C<sub>3</sub>D<sub>9</sub>NO  
**FW:** 84.2  
**Chemical Purity:** ≥98% (Trimethylamine N-oxide)  
**Deuterium**  
**Incorporation:** ≥99% deuterated forms (d<sub>1</sub>-d<sub>9</sub>); ≤1% d<sub>0</sub>  
**Supplied as:** A solid  
**Storage:** -20°C  
**Stability:** ≥4 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

### Laboratory Procedures

Trimethylamine-d<sub>9</sub> N-oxide is intended for use as an internal standard for the quantification of trimethylamine N-oxide (Item No. 17354) by GC- or LC-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).

Trimethylamine-d<sub>9</sub> N-oxide is supplied as a solid. A stock solution may be made by dissolving the trimethylamine-d<sub>9</sub> N-oxide in the solvent of choice, which should be purged with an inert gas. Trimethylamine-d<sub>9</sub> N-oxide is slightly soluble in methanol.

### Description

Trimethylamine N-oxide (TMAO) is a metabolite of choline, phosphatidylcholine, and L-carnitine (Item No. 21489).<sup>1</sup> It is formed by gut microbiota-mediated metabolism of choline, phosphatidylcholine, and L-carnitine to TMA followed by oxidation of TMA by flavin-containing monooxygenase 3 (FMO3) in the liver.<sup>1-3</sup> Dietary administration of TMAO (0.12% w/w) increases renal tubulointerstitial fibrosis, collagen deposition, and Smad3 phosphorylation in mice and increases aortic lesion area in atherosclerosis-prone ApoE<sup>-/-</sup> mice.<sup>1,4</sup> Plasma levels of TMAO are elevated in patients with chronic kidney disease and decreased in patients with active, compared with inactive, ulcerative colitis.<sup>1,2</sup> Elevated plasma levels of TMAO are associated with increased risk of cardiovascular disease.<sup>4</sup>

### References

1. Tang, W.H.W., Wang, Z., Kennedy, D.J., *et al.* Gut microbiota-dependent trimethylamine N-oxide (TMAO) pathway contributes to both development of renal insufficiency and mortality risk in chronic kidney disease. *Circ. Res.* **116**(3), 448-455 (2015).
2. Wilson, A., Teft, W.A., Morse, B.L., *et al.* Trimethylamine-N-oxide: A novel biomarker for the identification of inflammatory bowel disease. *Dig. Dis. Sci.* **60**(12), 3620-3630 (2015).
3. Zhang, L.S. and Davies, S.S. Microbial metabolism of dietary components to bioactive metabolites: Opportunities for new therapeutic interventions. *Genome Med.* **8**(1), 46 (2016).
4. Wang, Z., Klipfell, E., Bennett, B.J., *et al.* Gut flora metabolism of phosphatidylcholine promotes cardiovascular disease. *Nature* **472**(7341), 57-63 (2011).

#### WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

#### SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the [complete](#) Safety Data Sheet, which has been sent via email to your institution.

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