

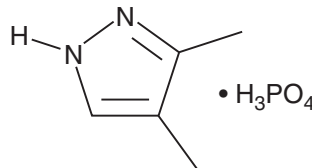
PRODUCT INFORMATION



3,4-Dimethylpyrazole (phosphate)

Item No. 21887

CAS Registry No.: 202842-98-6
Formal Name: 3,4-dimethyl-1H-pyrazole, monophosphate
Synonym: 3,4-DMPP
MF: C₅H₈N₂ • H₃PO₄
FW: 194.1
Purity: ≥98%
UV/Vis.: λ_{max}: 223 nm
Supplied as: A crystalline 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

3,4-Dimethylpyrazole (phosphate) (3,4-DMPP) is supplied as a crystalline solid. Aqueous solutions of 3,4-DMPP can be prepared by directly dissolving the crystalline solid in aqueous buffers. The solubility of 3,4-DMPP in PBS, pH 7.2, is approximately 10 mg/ml. We do not recommend storing the aqueous solution for more than one day.

Description

3,4-DMPP is an inhibitor of nitrification deemed safe by extensive standard toxicology and ecotoxicology tests.¹ When utilized on crops, 3,4-DMPP prevents nitrogen loss from soil, increases nitrogen use efficiency, and boosts crop yields.^{1,2} However, a meta-analysis found no influence of 3,4-DMPP on net crop yield, although it may boost yields in alkaline soil.³ 3,4-DMPP may be less effective in acidic soils and in the post-harvest period.^{4,5} DMPP interferes with ammonia monooxygenase from ammonia-oxidizing bacteria (AOB) and archaea (AOA) but may not directly affect AOB, AOA, and non-target populations.⁶

References

1. Zerulla, W., Barth, T., Dressel, J., et al. 3,4-Dimethylpyrazole phosphate (DMPP) – a new nitrification inhibitor for agriculture and horticulture. *Biol. Fertil. Soils* **34**(2), 79-84 (2001).
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3. Yang, M., Fang, Y., and Shi, Y. Efficiency of two nitrification inhibitors (dicyandiamide and 3, 4-dimethylpyrazole phosphate) on soil nitrogen transformations and plant productivity: A meta-analysis. *Sci. Rep.* **6**, 22075 (2016).
4. Shi, X., Hu, H.-W., Müller, C., et al. Effects of the nitrification inhibitor 3,4-dimethylpyrazole phosphate on nitrification and nitrifiers in two contrasting agricultural soils. *Appl. Environ. Microbiol.* **82**(17), 5236-5248 (2016).
5. Scheer, C., Rowlings, D., Firrell, M., et al. Nitrification inhibitors can increase post-harvest nitrous oxide emissions in an intensive vegetable production system. *Sci. Rep.* **7**, 43677 (2017).
6. Kong, X., Duan, Y., Schramm, A., et al. 3,4-Dimethylpyrazole phosphate (DMPP) reduces activity of ammonia oxidizers without adverse effects on non-target soil microorganisms and functions. *Soil Ecol.* **105**, 67-75 (2016).

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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