

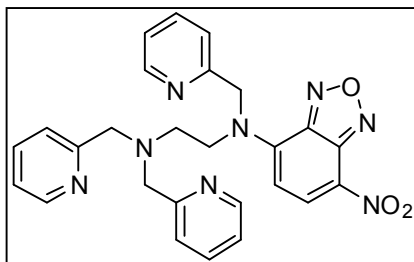
Product Information

N1-(7-Nitro-2,1,3-benzoxadiazol-4-yl)- N1,N2,N2-tris(2-pyridinylmethyl)-1,2-ethanediamine

Catalog Number **N1040**
Storage Temperature $-20\text{ }^{\circ}\text{C}$

CAS RN 1111625-98-9
Synonyms: *N*-(2-(Bis((pyridin-2-yl)methyl)amino)ethyl)-
7-nitro-*N*-((pyridin-2-yl)methyl)benzo[*c*][1,2,5]oxadiazole-
4-amine, NBD-TPEA

Product Description



Molecular formula: $\text{C}_{26}\text{H}_{24}\text{N}_8\text{O}_3$
Molecular weight: 496.52

λ_{max} : 480 nm
Fluorescence properties:
 λ_{Ex} : 470 nm
 λ_{Em} : 534 nm

Zinc is of critical importance in many biological processes, such as gene expression, enzyme regulation, and neurotransmission, and there is considerable interest in new and more effective fluorescent probes for Zn^{2+} detection.¹ Fluorescence measurement using chelators and ion probes provides a high level of sensitivity *in vivo* and *in vitro* for the determination of the presence and concentration of ions.

*N*1-(7-Nitro-2,1,3-benzoxadiazol-4-yl)-*N*1,*N*2,*N*2-tris(2-pyridinylmethyl)-1,2-ethanediamine has a high sensitivity for zinc ions. Using fluorescent detection, a linear response is observed for Zn^{2+} concentrations in the range of 1–10 μM (see Figures 1 and 2). It has good selectivity for Zn^{2+} in the presence of competing metal ions, such as Ca^{2+} , Mg^{2+} , Fe^{2+} , Fe^{3+} , and Mn^{2+} (see Figures 3 and 4).²

This product has been used *in vivo* to determine Zn^{2+} concentration in pancreatic β cells² and zebra fish larvae.³

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

This product is soluble at 0.5 mg/ml in DMSO.

Storage/Stability

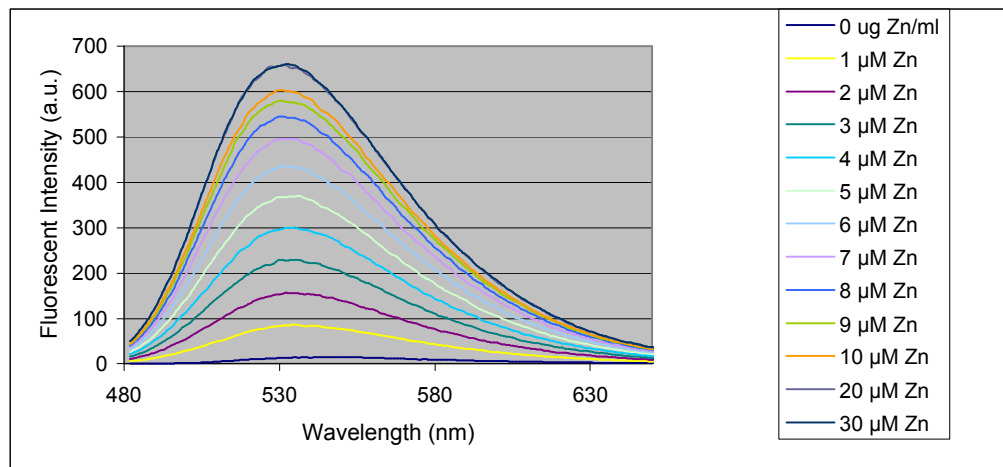
The product ships on wet ice and storage at $-20\text{ }^{\circ}\text{C}$ is recommended.

References

1. Nolan, E.M., and Lippard, S.J., Small-molecule fluorescent sensors for investigating zinc metalloneurochemistry. *Acc. Chem. Res.*, **42**, 193-203, (2009).
2. Xu, Z., et al., An NBD- based colorimetric and fluorescent chemosensor for Zn^{2+} and its use for the detection of intracellular zinc ions. *Tetrahedron*, **65**, 2307-2312, (2009).
3. Qian, F., et al., Visible light excitable Zn^{2+} fluorescent sensor derived from an intermolecular charge transfer fluorophore and its *in vitro* and *in vivo* application, *J. Amer. Chem. Soc.*, **131**, 1460-1468, (2009).

Figure 1.

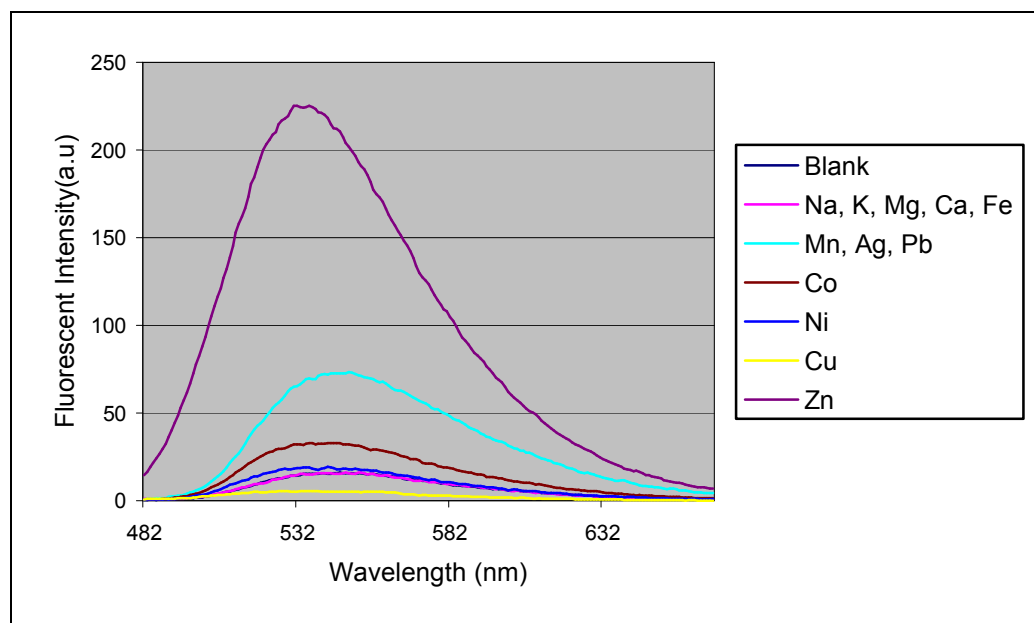
Fluorescence spectra of the product (Catalog Number N1040) in the presence of increasing zinc ion concentration



A 2.49 mM stock solution of the product was prepared in DMSO. This was diluted to 10 μM in 0.1 HEPES buffer, pH 7.2. Aliquots of zinc standard were added to the final concentration shown. Excitation wavelength 470 nm, Excitation slit width 2.5 nm, Emission slit width 5 nm.

Figure 2.

Fluorescence spectra of the product (Catalog Number N1040) in the presence of other metal ions

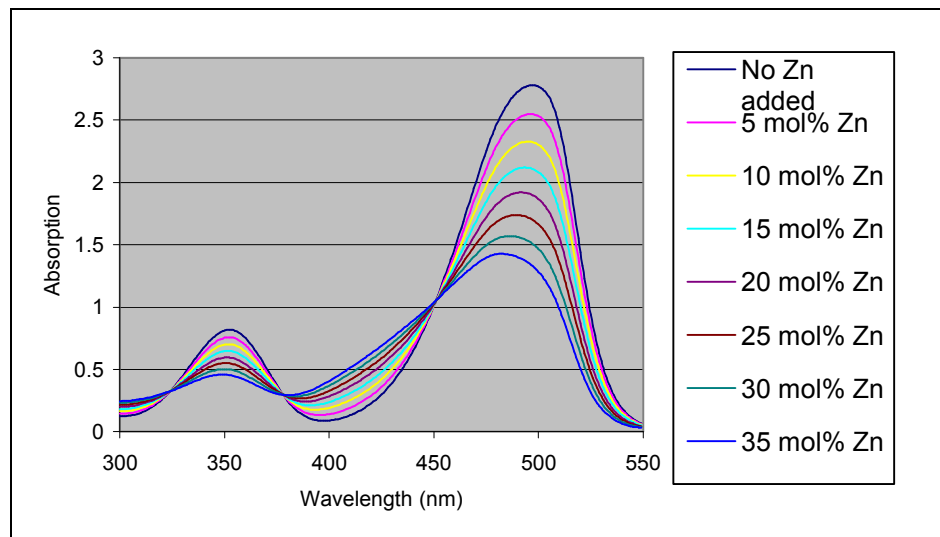


All metal ions at 30 mM except zinc ion concentration, which was 3 mM. Product concentration was 10 mM in 0.1 M HEPES buffer, pH 7.2.

Excitation wavelength 470 nm, Excitation slit width 2.5 nm, Emission slit width 5 nm.

Figure 3.

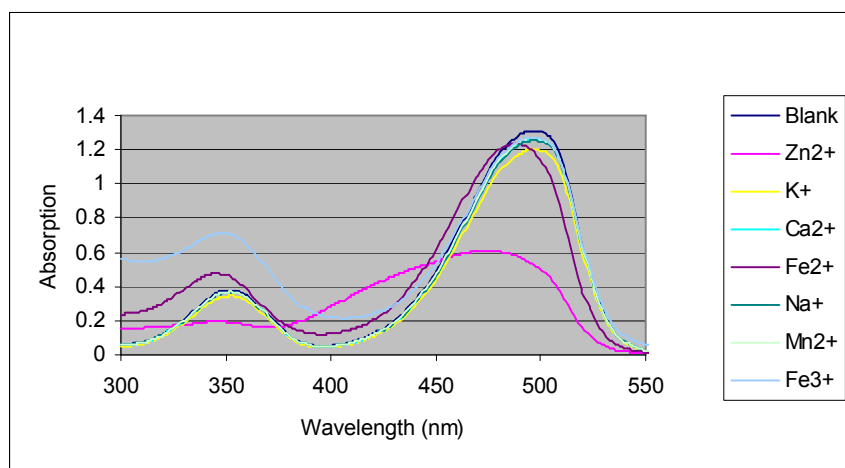
Ultraviolet absorption spectra of the product (Catalog Number N1040) in the presence of increasing zinc ion concentration



Final concentration of the product is 0.1 mM in HEPES buffer (1:9, DMSO/water, 100 mM KNO_3 ; 0.1 M HEPES, pH 7.2), with aliquots of zinc nitrate added (100 μM initial concentration).

Figure 4.

Ultraviolet absorption spectra of the product (Catalog Number N1040) in presence of various metal ions



Final concentration of the product is 0.1 mM in HEPES buffer (1:9, DMSO/water, 0.1 M HEPES, pH 7.2). Perchlorate salt solutions (10 mM) of Zn^{2+} , K^+ , Ca^{2+} , Fe^{2+} , Na^+ , Mn^{2+} , and Fe^{3+} in demineralized water were prepared. 500 μl of product solution was added to 500 μl of demineralized water and an aliquot (40 μl) of the metal ion solution added.

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