NECi Superior Enzymes
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Certificate of Analysis

Product: AtNaR: *Recombinant Higher plant (Arabidopsis thaliana NADH:Nitrate Reductase)*
SKUs: AtNaR-5U
Lot #: AtNaR- ######
CAS #: 9013-03-0
E.C. #: 1.7.1.1
Specific Activity: 5 - 15 units/mg enzyme protein
Purity: Greater than 95%
Physical Form: Freeze-dried protein glass 50 mM MOPS, pH 7.0, 0.1 mM EDTA, sugar
Activity Supplied: 5.0 Unit/vial
Active Temperature Range: Active at 15 – 40 °C. Temp optimum 35°C

Storage Conditions & Shelf Life Information*

**Shelf life guaranteed if stored as directed below*

	-80°C	-20°C	4°C	RT: 20°C – 25°C	Above 40°C
Freeze-Dried	3+ Years	2+ Years	1+ Year	6 months	Up to 1 week
In Solution+	1+ Year	6+ months	Up to 1 week	Not recommended	Not recommended

+ Enzyme provided with enzyme diluent working solution, contains 25% glycerol

Product Specifications

Immobilized Metal Affinity Chromatography (IMAC) purified yeast NADH: nitrate reductase expressed in the GRAS yeast *Pichia pastoris*. Purified to homogeneity by affinity chromatography[1]. NaR catalyzes NADH dependent reduction of nitrate to nitrite. The product has been highly purified so that it does not contain any residual fermentation material other than the highly purified enzyme. The product does not contain ingredients of animal, plant or microbial origin other than that used in the fermentation process. Additives are reagent grade. No hazardous materials. Functional in the presence of Cl^- ion and complex organics (e.g. humic acids). End use is for analysis of nitrate in agricultural, environmental, industrial, biomedical, water or wastewater samples.

General Information:

- **MOPS:** 3-[N-Morpholino]propanesulfonic acid)
- **Unit definition:** 1 unit reduces 1.0 µmole of nitrate to nitrite per minute with NADH, pH 7.5, 30°C
- **Protein Units:** 65 -200 micrograms of protein equals 1.0 U
- **Stability problems:** Thermal denaturation; pH extremes. Use standard precautions for proteins
- **Impurities & relative %'s:** High mw polymers of nitrate reductase, <5%; fragments of NaR
- **Additives & relative %'s:** 50 mM MOPS/ 0.1 mM EDTA, sugar > 99% of dry weight

Certified Analytical Grade by: Troy Kinnunen-Skidmore

Title: Head of Production

Date: 1/5/2017

[1] Modified method of Barbier, GG, RC Joshi, ER Campbell & WH Campbell (2004) ***Protein Expression and Purification* 37**: 61-71.

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