Formate Dehydrogenase

From Candida boidinii
Formate : NAD oxidoreductase EC 1.2.1.2
Cat. No. 10 244 678 001 80 U
Cat. No. 10 837 016 001 250 U

1. What this Product Does

Contents
80 U (Cat. No. 10 244 678 001) or 250 U (Cat. No. 10 837 016 001) lyophilizate.

Application
Most widely used in cofactor recycling systems for NADH.

Storage and Stability
Stable at +2 to +8°C until the expiration date printed on the label.
Store dry. No detectable decrease in activity within 6 months.

Substrate Specificity and Km
Formate dehydrogenase reacts only with formate (Km = 13 mM at 30°C and pH 7.5; 11 mM at 25°C and pH 7.5) and NAD (Km 0.09 mM; 30°C; pH 7.5). It does not react with acetate, oxaloate, lactate, succinate, propionate or ascorbate, nor will the enzyme reduce NADP.

2. How to Use this Product

2.1 Technical Tips

- Some commercial preparations of NAD contain formate. To avoid formate interference, use only the pure lithium salt of NAD (which contains no formate) in formate and oxalate assays with formate dehydrogenase.
- The presence of formaldehyde (≥ 5 mg in assay cuvette) will retard the activity of formate dehydrogenase. Increase the assay time for determination of formate content in samples which contain significant formaldehyde.
- Reducing substances such as sulfur dioxide (≥ 10 mg in the assay cuvette) retard the activity of formate dehydrogenase. To remove SO₂ from the assay, add 10 ml of 30% H₂O₂ (for 3 ml reaction mixture) to the cuvette.
- The presence of ethanol in the sample causes a creep reaction (reaction fails to reach a clear end point) in the assay of formate. Formate dehydrogenase contains low levels of alcohol dehydrogenase (ADH) which also utilizes NAD and will oxidize alcohol, leading to a slow increase in absorbance. To eliminate this interference during assay of alcohol-containing samples, add 3.4 mM pyrazole (ADH inhibitor) to the assay cuvette.

2.2 Analysis Information

Quality control assay
Unit definition
One unit (U) formate dehydrogenase will oxidize 1 µmol of formic acid to CO₂ in 1 min at 25°C and pH 7.6. The above assay produces 1 mmol of NADH per mmol of formate oxidized.

References

Changes to Previous Version
Editorial changes.
Correction of unit definition.

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