

ENZYMES

BY

SORACHIM

Formaldehyde Dehydrogenase from Pseudomonas sp.

FRD-201

SPECIFICATIONS

Name	Formaldehyde:NAD ⁺ oxidoreductase
EC	1.2.1.46
Appearance	White amorphous powder, lyophilized
Activity	Grade II, 1.0 U/mg-solid or more (contains approx. 70% stabilizers)
Contaminants	NADH oxidase: $\leq 1.0 \times 10^{-1}$ %
Stabilizers	Mg ²⁺ , Ca ²⁺ , bovine serum albumin, glycine, lysine
Stability	Stable at -20°C for at least 12 months
Molecular weight	approx. 150,000 (by gel filtration)
Isoelectric point	5.25
Michaelis constants	8.0×10^{-5} M (HCHO), 1.2×10^{-4} M (NAD ⁺)
Structure	2 subunits (75,000) per mol of enzyme
Inhibitors	Chelating agents, Ni ²⁺ , Cd ²⁺ , Hg ²⁺ , PCMB, ionic detergents
Optimum pH	9.0
Optimum temperature	40°C
pH Stability	pH 8.0 - 10.0 (30°C, 16hr)
Thermal stability	below 40°C (pH 7.5, 30min)

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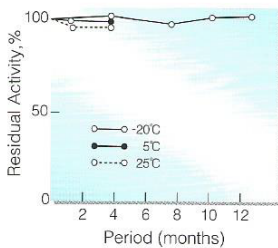


Fig.1. Stability (Powder form)
[kept under dry conditions]

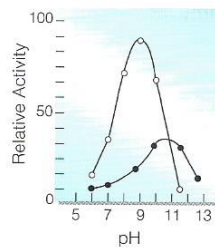


Fig.3. pH-Activity
[37°C, 15min-reaction in 50mM buffer solution: pH6-7.6, phosphate; pH7.2-8.8, Tris-HCl; pH8.7-11 Na₂CO₃; pH11.5-12.5; NaOH-KCl]
○, activity for formaldehyde;
●, activity for n-butanol

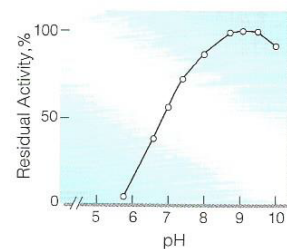


Fig.5. pH-Stability
[30°C, 16hr-treatment with 50mM buffer solution: pH5.8, acetate; pH6.8-8.0, phosphate pH8.0-10.0 borate]

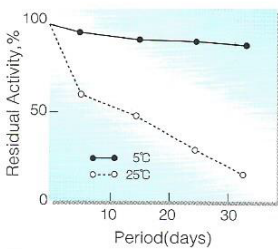


Fig.2. Stability (Liquid form)
[enzyme concentration: 10U/ml
buffer composition: 50mM K-phosphate buffer, pH7.5]

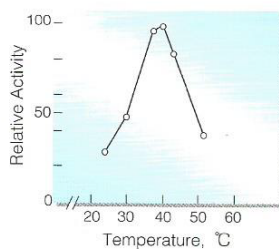


Fig.4. Temperature activity
[15min-reaction in 50mM phosphate buffer, pH7.5]

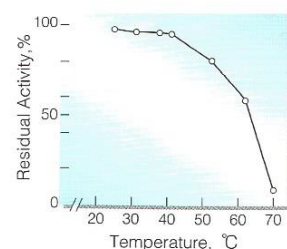


Fig.6. Thermal stability
[30min-treatment with 50mM phosphate buffer, pH7.5]

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