

## Product Information

### Alcohol Dehydrogenase from *Saccharomyces cerevisiae*

Catalog Number **A7011**  
Storage Temperature  $-20\text{ }^{\circ}\text{C}$

CAS RN 9031-72-5  
EC 1.1.1.1  
Synonyms: ADH; Alcohol:NAD<sup>+</sup> oxidoreductase;  
Alcohol Dehydrogenase from baker's yeast

#### Product Description

Alcohol dehydrogenase can be used for the enzymatic determination of low concentrations of ethanol in aqueous samples.<sup>1</sup>

Molecular weight:<sup>2,3</sup> 141-151 kDa

The yeast enzyme is a tetramer containing 4 equal subunits. The active site of each subunit contains a zinc atom.<sup>4</sup> Each active site also contains 2 reactive sulfhydryl groups and a histidine residue.<sup>5-7</sup>

Isoelectric point:<sup>8</sup> 5.4-5.8

Optimal pH:<sup>4</sup> 8.6-9.0

Cofactors:  $\beta$ -NAD and  $\beta$ -NADH

Substrates: Yeast ADH is most active with ethanol and its activity decreases as the size of the alcohol increases<sup>9</sup> or decreases.<sup>8</sup> Branched chain alcohols and secondary alcohols also have very low activity.

$K_M$  (ethanol) =  $2.1 \times 10^{-2}$  M  
 $K_M$  (methanol) =  $1.3 \times 10^{-1}$  M  
 $K_M$  (isopropanol) =  $1.4 \times 10^{-1}$  M

Inhibitors: Compounds that react with free sulfhydryls, including N-alkylmaleimides and iodoacetamide.<sup>10</sup>

Zinc chelator inhibitors, including 1,10-phenanthroline, 8-hydroxyquinoline, 2,2'-dipyridyl, and thiourea.<sup>11</sup>

Substrate analogue inhibitors, including  $\beta$ -NAD analogs, purine and pyrimidine derivatives, chloroethanol, and fluoroethanol.<sup>8</sup>

This product is supplied as a lyophilized powder containing  $\leq 2\%$  citrate buffer salts.

Specific activity:  $\geq 300$  units/mg protein

Unit definition: One unit will convert 1.0  $\mu$ mole of ethanol to acetaldehyde per minute at pH 8.8 at  $25\text{ }^{\circ}\text{C}$ .

Protein:  $\geq 90\%$  (UV absorbance)

Extinction coefficient:<sup>5</sup>  $E^{1\%} = 14.6$  (water, 280 nm)

#### 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

The lyophilized powder is soluble in water (1 mg/ml), yielding a clear to slightly hazy solution.

#### Storage/Stability

The product ships on dry ice and storage at  $-20\text{ }^{\circ}\text{C}$  is recommended. When stored at  $-20\text{ }^{\circ}\text{C}$ , the enzyme retains activity for at least 4 years.

In solutions of  $\geq 1$  mg/ml, ADH retains all of its activity after 90 minutes, when stored at  $0\text{ }^{\circ}\text{C}$  or at room temperature. More dilute solutions of ADH are quite unstable. Freezing and thawing of ADH solutions is not recommended.

#### Related Products

Ethanol (Catalog Number 493546)  
 $\beta$ -NAD ( $\beta$ -nicotinamide adenine dinucleotide hydrate, Catalog Number N7004)

## References

1. Bernt, E., and Ingeborg, G., *Methods of Enzymatic Analysis*, Bergmeyer, H.U., ed., Academic Press (New York, NY: 1974), pp. 1499-1503.
2. Jornvall, H., *Eur. J. Biochem.*, **72**, 425-442 (1977).
3. Hayes, H.E., and Velvick, S.F., *J. Biol. Chem.*, **207**, 225-244 (1954).
4. *Worthington Enzyme Manual*, Worthington, V., ed., Worthington Biochemical Corporation (Freehold, NJ: 1988), p 16.
5. Buhner, M., and Sund, H., *Eur. J. Biochem.*, **11**, 73-79 (1969).
6. Kagi, J.R.H., and Vallee, B.L., *J. Biol. Chem.*, **235**, 3188-3192 (1960).
7. Dickenson, C.J., and Dickenson, F.M., *Eur. J. Biochem.*, **52**, 595-603 (1975).
8. Sund, H., and Theorell, H., in *The Enzymes*, 2<sup>nd</sup> ed., P. Boyer, ed., Academic Press (New York, NY: 1963), pp. 57-83.
9. Green, D.W., *et al.*, *J. Biol. Chem.*, **268**, 7792-7798 (1993).
10. Heitz, J.R., *et al.*, *Arch. Biochem. Biophys.*, **127**, 627-636 (1968).
11. Vallee, B.L., and Hoch, F.L., *PNAS, USA*, **41**, 327-338 (1955).

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