**Product Information**

**Alcohol Oxidase**  
from *Candida boidinii*

Catalog Number A6941  
Storage Temperature –20 °C

CAS RN 9073-63-6  
EC 1.1.3.13  
Synonym: Alcohol:oxygen oxidoreductase

**Product Description**  
Alcohol oxidase catalyzes the oxidation of short-chain, primary, aliphatic alcohols to the respective aldehydes.

\[
RCH_2OH + O_2 \rightarrow RCHO + H_2O_2
\]

The enzyme has the highest affinity for methanol with the affinity decreasing with increasing chain length of the alkyl (R) group.

Alcohol oxidase plays a major role in the metabolism of methanol resulting in the formation of formaldehyde and has been detected in several genera of yeasts, such as *Candida*, *Pichia*, and *Hansenula*, that utilize methanol as a sole carbon and energy source.\(^1,2\)

Primarily localized in the peroxisome, alcohol oxidase has also been found in the cytoplasm. Monomers are synthesized in the cytosol and assembled into octomers in the peroxisome. Octomerization is thought to be chaperone mediated.\(^3\) Alcohol oxidase is of interest for the study of protein translocation into peroxisomes.\(^4\)

\[K_M\] (mM):\(^5\)

\[
\begin{array}{ll}
\text{Methanol} & 3 \\
2\text{-Propin-1-ol} & 10 \\
1,4\text{-Butynediol} & 36 \\
4\text{-Hydroxy-2-butynal} & 0.44 \\
\end{array}
\]

Other substrates:\(^2,5\)

methanol  
ethanol  
n-propanol  
n-butanol  
chloroethanol  
2-propenol-1-ol  
2-propynol-1-ol  
2-butynol-1-ol  
1,4-butynoldiol  
formaldehyde

The enzyme shows little activity toward secondary, tertiary, or aromatic alcohols; or aliphatic alcohols with a chain length of more than 5 carbons.\(^2,6,7\)

Molecular mass:\(^5\) 600 kDa (octomer, sedimentation equilibrium)

Alcohol oxidase is a homoooligomeric flavoprotein with eight equal 74 kDa subunits; each containing a flavin adenine dinucleotide (FAD) molecule.\(^2\)

Cofactor: FAD, one molecule/subunit

Isoelectric point: \(^6\) 5.4–5.8

pH Range: \(^9\) 6.5–8.5

pH Optimum: \(^2\) 7.5

Inhibitors: \(^5,6,9\)

<table>
<thead>
<tr>
<th>Inhibitor</th>
<th>Concentration</th>
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<tbody>
<tr>
<td>H(_2)O(_2)</td>
<td></td>
</tr>
<tr>
<td>PCMB</td>
<td></td>
</tr>
<tr>
<td>Iodoacetate</td>
<td></td>
</tr>
<tr>
<td>1,4-butynediol</td>
<td></td>
</tr>
<tr>
<td>Cyclopropanone</td>
<td></td>
</tr>
<tr>
<td>4-Hydroxy-2-butylnal</td>
<td></td>
</tr>
<tr>
<td>Iodide</td>
<td></td>
</tr>
<tr>
<td>Propionaldehyde</td>
<td></td>
</tr>
<tr>
<td>Sodium acetate</td>
<td></td>
</tr>
<tr>
<td>Diethyldicarbonate</td>
<td></td>
</tr>
<tr>
<td>Hg(^{2+}) ion</td>
<td>(reversible by 2-mercaptoethanol)</td>
</tr>
<tr>
<td>Ag(^+) and Cu(^{2+}) ions</td>
<td>(5% inhibition at 1 mM, EDTA reversible)</td>
</tr>
</tbody>
</table>

This product (A6941) is purified from *Candida boidinii* and is supplied as a lyophilized powder containing potassium phosphate buffer salts, DTE, and stabilizer.

Protein content: 5–15%  
Specific activity: 5–15 units/mg protein

Unit definition: One unit will oxidize 1.0 μmole of methanol to formaldehyde per minute at pH 7.5 at 25 °C.

**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
Alcohol oxidase is soluble (1 mg protein/ml) in cold 100 mM potassium phosphate, pH 7.5, at 25 °C. Solutions should be prepared just before use.

Storage/Stability
Store the product, as supplied, at –20 °C. It remains active for at least 2 years when stored at –20 °C.

References