

Ascorbate Oxidase (ASO) from Cucurbit sp.

np226971

Storage temperature: Store at 2-8°C short term (1-2 weeks). Store at -20°C long term (3 years). Upon reconstitution, it is recommended to aliquot. Avoid freeze/thaw cycle. Store in the dark. Desiccated.

Introduction:

In enzymology, a L-ascorbate oxidase is an enzyme that catalyzes the chemical reaction: $2 \text{ L-ascorbate} + \text{O}_2 \leftrightarrow 2 \text{ dehydroascorbate} + 2 \text{ H}_2\text{O}$. Thus, the two substrates of this enzyme are L-ascorbate and O_2 , whereas its two products are dehydroascorbate and H_2O . This enzyme belongs to the family of oxidoreductases, specifically those acting on diphenols and related substances as donor with oxygen as acceptor. This enzyme participates in ascorbate metabolism. It employs one cofactor, copper.

Michaelis constant: $3.6 \times 10^{-4} \text{ M}$ (L-Ascorbate acid)

Optimum pH: 6.0~6.5

Optimum temperature: 45°C~50°C

pH Stability: 4.5~9.5 (25°C, 20hr)

Thermal stability: <50°C (pH 7.0, 30min)

Inhibitors: Fe^{3+} , Ni^{2+} , Proclin, SDS

Effect of various chemicals:

Fig.1

Fig.3

Fig.2

Fig.4

Table 1

Reaction

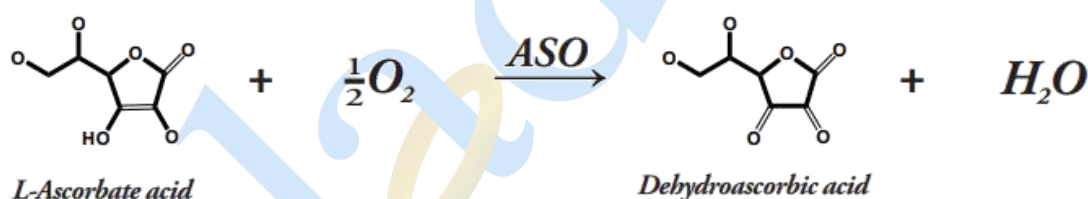


Table 1.

Effect of Various Chemicals on ASO

[The enzyme dissolved in 50mM PIPES buffer, pH 7.5 (10U/ml) was incubated with each chemical at 37°C for 2hr.]

Chemical	Concn. (mM)	Residual activity
None	-	100%
CaCl ₂	2.0	100%
CoCl ₂	2.0	102%
CuSO ₄	2.0	160%
FeCl ₃	2.0	76%
MgSO ₄	2.0	104%
MnSO ₄	2.0	100%
NiCl ₂	2.0	70%
ZnSO ₄	2.0	102%
K ₄ Fe(CN) ₆	2.0	89%

Chemical	Concn. (mM)	Residual activity
BME	2.0	80%
NEM	2.0	93%
EDTA	5.0	102%
NaN ₃	20.0	97%
Proclin	0.045%	73%
Na-cholate	0.10%	111%
SDS	0.05%	8%
Triton X-100	0.10%	108%
Tween 20	0.10%	112%

Fig. 1 pH Activity

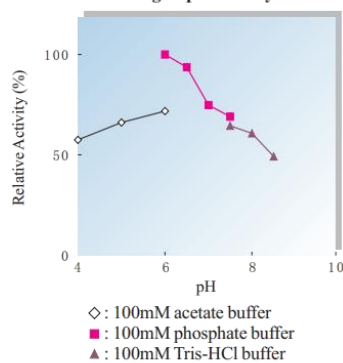


Fig. 3 Temperature activity

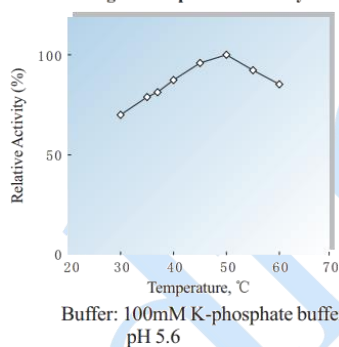


Fig. 2 pH Stability

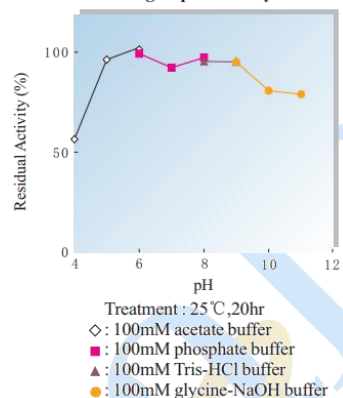


Fig. 4 Thermal stability

