

Product Information

Carbonic Anhydrase II, bovine recombinant, expressed in *Escherichia coli*

Catalog Number **C7749**

Storage Temperature $-20\text{ }^{\circ}\text{C}$

Synonym: CA II

Product Description

Carbonic anhydrases (CA) are a family of enzymes that catalyze the rapid conversion of carbon dioxide to bicarbonate and protons, a reaction that occurs rather slowly in the absence of a catalyst. The active site of most carbonic anhydrases contains a zinc ion. They are, therefore, classified as metalloenzymes.¹⁻²

Carbonic anhydrases are widely distributed in plant and animal tissues where they are involved in diverse physiological processes, such as photosynthesis, pH homeostasis, calcification, and bone resorption.

There are at least five distinct CA families (α , β , γ , δ , and ϵ). These families have no significant amino acid sequence similarity and, in most cases, are thought to be an example of convergent evolution. The α -CAs are found in humans. At least 14 isoforms of α -CA have been identified in vertebrates with different physiological and pathological roles. The enzymes can be localized in the cytosol or mitochondria, be membrane bound with extracellular domains, or be secreted.²⁻⁴

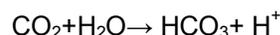
Bovine carbonic anhydrase II (CA II) is a cytosolic, single-chain, ~ 29 kDa enzyme. It has been widely used as a model protein in the investigation of the protein folding process.⁵

The product is supplied as a solution in 20 mM Tris, pH 7.6, with 150 mM NaCl.

Purity: $\geq 90\%$ (SDS-PAGE)

Enzyme activity:

Conversion of carbon dioxide to bicarbonate:



Specific activity: ≥ 5000 units/mg

Unit Definition: One unit will decrease the pH of a 20 mM Tris buffer from pH 8.3 to pH 6.3 in 1 minute at $0\text{ }^{\circ}\text{C}$.

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.

Storage/Stability

Store the product at $-20\text{ }^{\circ}\text{C}$. The product is stable for at least 2 years as supplied.

After initial thawing, the enzyme should be refrozen at $-20\text{ }^{\circ}\text{C}$ in aliquots.

References

1. Badger, M.R., and Price, G.D., The role of carbonic anhydrase in photosynthesis. *Annu. Rev. Plant Physiol. Plant Mol. Biol.*, **45**, 369–392 (1994).
2. Tashian, R.E., The carbonic anhydrases: widening perspectives on their evolution, expression and function. *BioEssays*, **10**, 186–192 (1989).
3. Tashian, R.E., Genetics of the mammalian carbonic anhydrases. *Adv. Genet.*, **30**, 321–356 (1992).
4. Kavroulakis, N., et al., Tissue distribution and subcellular localization of carbonic anhydrase in mature soybean root nodules indicates a role in CO_2 diffusion. *Plant Physiol. Biochem.*, **41**, 479–484 (2003).
5. Wei, X., et al., Conformational changes and inactivation of bovine carbonic anhydrase II in 2,2,2-trifluoroethanol solutions. *Biochemistry (Mosc)*, **71**, Suppl 1:S77-S82 (2006).

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