

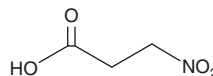
# PRODUCT INFORMATION



## 3-Nitropropionic Acid

Item No. 14684

**CAS Registry No.:** 504-88-1  
**Formal Name:** 3-nitro-propanoic acid  
**Synonyms:**  $\beta$ -Nitropropionic Acid, 3-NP, NSC 64266  
**MF:** C<sub>3</sub>H<sub>5</sub>NO<sub>4</sub>  
**FW:** 119.1  
**Purity:**  $\geq$ 95%  
**Supplied as:** A crystalline solid  
**Storage:** -20°C  
**Stability:**  $\geq$ 4 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

### Laboratory Procedures

3-Nitropropionic acid (3-NP) is supplied as a crystalline solid. A stock solution may be made by dissolving the 3-NP in the solvent of choice. 3-NP acid is soluble in organic solvents such as ethanol and DMSO, which should be purged with an inert gas. The solubility of 3-NP in these solvents is approximately 10 mg/ml.

### Description

3-NP is an irreversible inhibitor of mitochondrial respiratory Complex II succinate dehydrogenase, resulting in energy depletion through disruption of the electron transport chain.<sup>1-3</sup> This compound is a natural toxin of certain plants and fungi. Administration of 3-NP to rats (12 mg/kg per day) produces progressive striatal degeneration, while lower doses (8 mg/kg daily) in nonhuman primates results in neuropathologic and clinical features of Huntington's disease.<sup>1</sup> Conversely, Huntington's disease results in a loss of Complex II activity.<sup>2</sup> 3-NP also induces convulsions and is used to examine interventions effective in a mouse model of epilepsy.<sup>4</sup>

### References

1. Brouillet, E., Hantraye, P., Ferrante, R.J., *et al.* Chronic mitochondrial energy impairment produces selective striatal degeneration and abnormal choreiform movements in primates. *Proc. Natl. Acad. Sci. USA* **92**, 7105-7109 (1995).
2. Huang, L., Sun, G., Cobessi, D., *et al.* 3-Nitropropionic acid is a suicide inhibitor of mitochondrial respiration that, upon oxidation by complex II, forms a covalent adduct with a catalytic base arginine in the active site of the enzyme. *J. Biol. Chem.* **281(9)**, 5965-5972 (2006).
3. Ayala-Peña, S. Role of oxidative DNA damage in mitochondrial dysfunction and Huntington's disease pathogenesis. *Free Radic. Biol. Med.* **62**, 102-110 (2013).
4. Zuchora, B., Tursji, W.A., Wielosz, M., *et al.* Protective effect of adenosine receptor agonists in a new model of epilepsy--seizures evoked by mitochondrial toxin, 3-nitropropionic acid, in mice. *Neurosci. Lett.* **305(2)**, 91-94 (2001).

#### WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

#### SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

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#### CAYMAN CHEMICAL

1180 EAST ELLSWORTH RD  
ANN ARBOR, MI 48108 · USA

**PHONE:** [800] 364-9897  
[734] 971-3335

**FAX:** [734] 971-3640

CUSTSERV@CAYMANCHEM.COM  
WWW.CAYMANCHEM.COM