

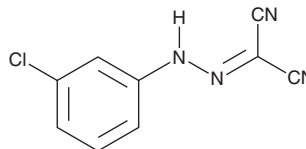
PRODUCT INFORMATION



CCCP

Item No. 25458

CAS Registry No.: 555-60-2
Formal Name: 2-[2-(3-chlorophenyl)hydrazinylidene]-propanedinitrile
Synonyms: Carbonyl cyanide *m*-chlorophenyl hydrazone, NSC 88124
MF: C₉H₅ClN₄
FW: 204.6
Purity: ≥98%
UV/Vis.: λ_{max}: 248, 353 nm
Supplied as: A crystalline solid
Storage: -20°C
Stability: ≥4 years



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

Laboratory Procedures

CCCP is supplied as a crystalline solid. A stock solution may be made by dissolving the CCCP in the solvent of choice, which should be purged with an inert gas. CCCP is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF). The solubility of CCCP in ethanol is approximately 2 mg/ml and approximately 10 mg/ml in DMSO and DMF.

Further dilutions of the stock solution into aqueous buffers or isotonic saline should be made prior to performing biological experiments. Ensure that the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. Organic solvent-free aqueous solutions of CCCP can be prepared by directly dissolving the crystalline solid in aqueous buffers. The solubility of CCCP in PBS (pH 7.2) is approximately 0.1 mg/ml. We do not recommend storing the aqueous solution for more than one day.

Description

CCCP is a protonophore mitochondrial uncoupler that increases membrane permeability to protons, leading to a disruption in the mitochondrial membrane potential.¹ It inhibits mitochondrial respiration and ATPase activity when used at concentrations of 110 and 35 nM, respectively.² CCCP inhibits activation of stimulation of interferon genes (STING), decreasing the expression of downstream STING targets, including IFN-β, TBK1, and IRF3 when used at a concentration of 50 μM in RAW 264.7 cells.³ It induces mitochondrial fission in a manner dependent on the GTPase Drp1. CCCP (4 mg/kg) increases body temperature as well as left ventricular systolic and diastolic dimensions and decreases fractional shortening in rats.⁴ It also increases myocardial glucose and fatty acid uptake in rats.

References

1. Kane, M.S., Paris, A., Codron, P., *et al.* Current mechanistic insights into the CCCP-induced cell survival response. *Biochem. Pharmacol.* **148**, 100-110 (2018).
2. Terada, H. The interaction of highly active uncouplers with mitochondria. *Biochim. Biophys. Acta.* **639(3-4)**, 225-242 (1981).
3. Kwon, D., Park, E., Sesaki, H., *et al.* Carbonyl cyanide 3-chlorophenylhydrazone (CCCP) suppresses STING-mediated DNA sensing pathway through inducing mitochondrial fission. *Biochem. Biophys. Res. Commun.* **493(1)**, 737-743 (2017).
4. Minanimo-Muta, E., Kato, T., Shioi, T., *et al.* Cardiac effects of acute administration of a protonophore in a rat model. *J. Pharm. Pharmacol.* **70(9)**, 1209-1215 (2018).

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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