Certificate of Analysis

Product Name: **Methylene Blue** **Catalog No.: 3213** **Batch No.: 1**

CAS Number: 61-73-4 EC Number: 200-515-2

IUPAC Name: 3,7-*bis*(Dimethylamino)phenazathionium chloride

1. PHYSICAL AND CHEMICAL PROPERTIES

Batch Molecular Formula: $C16H18ClN3S.2¾H_2O$

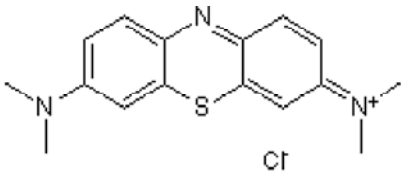
Batch Molecular Weight: 369.39

Physical Appearance: Green solid

Solubility: water to 10 mM
DMSO to 10 mM
ethanol to 10 mM

Storage: Store at RT

Batch Molecular Structure:



2. ANALYTICAL DATA

HPLC: Shows >95.1% purity

^{1}H NMR: Consistent with structure

Mass Spectrum: Consistent with structure

Microanalysis:

	Carbon	Hydrogen	Nitrogen
Theoretical	52.02	6.41	11.38
Found	51.9	6.09	11.2

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Description:

Methylene Blue is a biological stain and redox indicator. Methylene blue inhibits monoamine oxidase A, tau filament formation and nitric oxide synthase (IC_{50} values = 0.07 µM, 1.9 µM and 5.3 µM, respectively), and inhibits guanylate cyclase. Methylene Blue delays senescence and stimulates proliferation of fibroblasts and skin cells. Methylene Blue promotes wound healing, upregulates elastin expression and production in vitro, increases synthesis of heme, is neuroprotective (EC_{50} = 0.18 nM) and rescues the loss of dopaminergic neurons induced by Rotenone (Cat. No. 3616). Also antimalarial. Please see product specific page on www.tocris.com for full description.

Physical and Chemical Properties:

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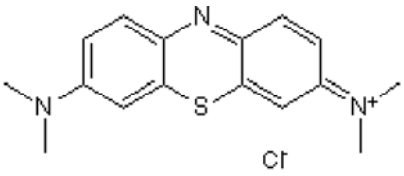

Storage: Store at RT

Solubility & Usage Info:

water to 10 mM
DMSO to 10 mM
ethanol to 10 mM

Stability and Solubility Advice:

Some solutions can be difficult to obtain and can be encouraged by rapid stirring, sonication or gentle warming (in a 45-60°C water bath).

Information concerning product stability, particularly in solution, has rarely been reported and in most cases we can only offer a general guide. Our standard recommendations are:

SOLIDS: Provided storage is as stated on the product label and the vial is kept tightly sealed, the product can be stored for up to 6 months from date of receipt.

SOLUTIONS: We recommend that stock solutions, once prepared, are stored aliquoted in tightly sealed vials at -20°C or below and used within 1 month. Wherever possible solutions should be made up and used on the same day.

References:

Poteet *et al* (2012) Neuroprotective actions of methylene blue and its derivatives. PLoS One ***7***. PMID: 23118969.

Wen *et al* (2011) Alternative mitochondrial electron transfer as a novel strategy for neuroprotection. J.Biol.Chem. ***286*** 16504. PMID: 21454572.

Atamna *et al* (2008) Methylene blue delays cellular senescence and enhances key mitochondrial biochemical pathways. FASEB J. ***22*** 703. PMID: 17928358.

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