

# Methylene BLUE



A versatile dye used for medicinal applications, now a potential, alternative treatment in SARS-CoV-2 infection complications.

## PRODUCT IN FOCUS

**EXSYN**<sup>®</sup>  
ESSENTIAL CHEMISTRY

## Methylene Blue (MB)

### INTRODUCTION

Methylene blue (MB), a basic thiazine dye has been used clinically for about a century to treat numerous ailments. Primarily used in the treatment of methemoglobinemia, as an antidote in cyanide poisoning, as a biological stain, and as an oxidant-reduction indicator.

The intravenous form of MB is approved by the FDA for the treatment of pediatric and adult patients with acquired methemoglobinemia. MB is an investigational drug being developed by the University of Aberdeen and TauRx Therapeutics that has been shown in early clinical trials to be an inhibitor of Tau protein aggregation. The drug is also of potential interest for the treatment of patients with Alzheimer's disease.

### MEDICAL APPLICATIONS

#### Methemoglobinemia

MB is employed as a medication for the treatment of methemoglobinemia

#### Combined with light

MB combined with light has been used to treat resistant plaque psoriasis

#### Urinary tract infection

MB is a component of a urinary analgesic/anti-infective/anti-spasmodic known as "Prosed DS", a combination of phenyl salicylate, benzoic acid, hyoscyamine sulfate, and methenamine (aka hexamethylenetetramine and not to be confused with 'methanamine')

#### Cyanide poisoning

Since its reduction potential is similar to that of oxygen and can be reduced by components of the electron transport chain, large doses of methylene blue are sometimes used as an antidote to potassium cyanide poisoning

#### Dye or stain

MB is used in endoscopic polypectomy as an adjunct to saline or epinephrine and is used for injection into the submucosa around the polyp to be removed

#### Synonyms

Methylthionium chloride  
Basic blue 9 (C.I. 52015)

#### CAS no.

122965-43-9 (hydrate)  
7220-79-3 (trihydrate)  
61-73-4 (anhydrous)

#### EINECS no.

602-909-3 (hydrate)  
615-731-6 (trihydrate)  
200-515-2 (anhydrous)

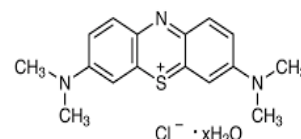
#### Molecular formula

$C_{16}H_{18}N_3S.Cl_x.H_2O$

#### Molecular weight

337.90 (hydrate & trihydrate)  
319.85 (anhydrous)

#### Structure



# Methylene BLUE



A versatile dye used for medicinal applications, now a potential, alternative treatment in SARS-CoV-2 infection complications.

## PRODUCT IN FOCUS

**EXSYN**<sup>®</sup>  
ESSENTIAL CHEMISTRY

## Methylene Blue (MB)

### MEDICAL APPLICATIONS

#### Placebo

MB has been used as a placebo; physicians would tell their patients to expect their urine to change color and view this as a sign that their condition had improved

#### Ifosfamide toxicity

Another use of methylene blue is to treat Ifosfamide neurotoxicity

#### Shock

It has also been used in septic shock and anaphylaxis

### OTHER APPLICATIONS

#### Redox indicator

MB is widely used as a redox indicator in analytical chemistry

#### Peroxide generator

MB is also a photosensitizer used to create singlet oxygen when exposed to both oxygen and light

#### Biological staining

In biology MB is used as a dye for number of different staining procedures, such as Wright's stain and Jenner's stain. Since it is a temporary staining technique, MB can also be used to examine RNA or DNA under the microscope or in a gel

#### Aquaculture

MB is used in aquaculture and by tropical fish hobbyists as a treatment for fungal infections

### Modes of action of Methylene Blue in SARS-CoV-2 infection complications (as per the current ongoing studies. Concrete data to be available soon)

- Y It inhibits SARS-CoV-2 spike ACE2 protein - protein interaction
- Y To treat Cytokinin Storm which is one of the major reason for ADRs, Multiorgan Failure & Mortality
- Y It relieves oxidative stress, ROS and free radicals
- Y It increases systemic vascular resistance (SVR) in septic shock
- Y It causes antifibrotic action in lungs

# Methylene BLUE



A versatile dye used for medicinal applications, now a potential, alternative treatment in SARS-CoV-2 infection complications.

## PRODUCT IN FOCUS

**EXSYN**<sup>®</sup>  
ESSENTIAL CHEMISTRY

## Methylene Blue (MB)

### SPECIFICATIONS

MB offered by Exsyn complies USP & EP pharmacopeia. Please ask our sourcing team if you need detailed specifications.

### WRITTEN CONFIRMATION (WC)

ExSyn offers MB with WC certification, so it can be sold to the EU as an API for human consumption.

### STORAGE

Temporary storage temperature is below **30°C**

Long term storage temperature is **5°C ± 3°C**

ExSyn offers MB on commercial scale and welcomes enquiries. No matter the quantity you need, our exceptional quality and service will make ExSyn your supplier of choice! If you need any additional information or SDS, please get in touch with us.