

Prussian blue insoluble

Chemical Properties

CAS No. :	14038-43-8
Formula:	C ₆ FeN ₆ .4/3Fe
Molecular Weight:	286.41
Storage:	Powder: -20°C for 3 years In solvent: -80°C for 1 year Actual storage temperature shall be subject to the COA.

Biological Description

Description	Prussian blue insoluble is an antidote that effectively captures and promotes the excretion of heavy metal ions such as cesium and thallium in the gastrointestinal tract through ion exchange. Additionally, Prussian blue insoluble possesses antibacterial and antitumor activities and can serve as a contrast agent for photoacoustic imaging and magnetic resonance imaging (MRI). Prussian blue insoluble can also be used as an adsorbent for the effective removal of heavy metals (Cu(II), Co(II), Ni(II), and Pb(II)) from aqueous solutions.
Targets(IC50)	Antibacterial
In vitro	<p>Method: Human cervical cancer HeLa cells were treated with PEGylated Prussian blue nanoparticles (PEGylated PB NPs) at concentrations of 50 $\mu\text{g}\cdot\text{mL}^{-1}$ and 100 $\mu\text{g}\cdot\text{mL}^{-1}$, followed by exposure to NIR laser irradiation (808 nm, 2.0 W) for different durations (0, 3, 5 min). Cell killing effects were assessed using live/dead cell staining (calcein-AM / PI) and the MTT assay.</p> <p>Result: PEGylated PB NPs exhibited no obvious toxicity to HeLa cells in the absence of laser irradiation. After 5 min of NIR laser irradiation, a significant induction of cell death was observed at 50 $\mu\text{g}\cdot\text{mL}^{-1}$, and the killing effect increased with longer irradiation time and higher NP concentration[1].</p> <p>Method: Escherichia coli suspensions ($10\text{-}10^8$ CFU/mL) were incubated with insoluble Prussian blue (PBins, 0.07 mM) nanoparticles in MH medium (pH 6.2) for 24 h. The reduction of Prussian blue to Prussian white was monitored by measuring absorbance spectra (400–900 nm) every hour.</p> <p>Result: At a bacterial concentration of 10^8 CFU/mL, PBins were completely reduced to colorless Prussian white within <10 h; at a low concentration of 10 CFU/mL, complete decolorization required approximately 20 h[2].</p>

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	3.4915 mL	17.4575 mL	34.915 mL
5 mM	0.6983 mL	3.4915 mL	6.983 mL
10 mM	0.3491 mL	1.7457 mL	3.4915 mL
50 mM	0.0698 mL	0.3491 mL	0.6983 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

- Chen H, et al. Facile synthesis of Prussian blue nanoparticles as pH-responsive drug carriers for combined photothermal-chemo treatment of cancer. RSC Advances. 2016 Oct 9; 7:248-255.
- Ferrer-Vilanova A, et al. Electrochromogenic Detection of Live Bacteria Using Soluble and Insoluble Prussian Blue. ACS Omega. 2021;6(46):30989-30997.

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