

Citrate-modified Prussian Blue Nanoparticles

C1520782

Storage: 2-8°C.

Shipping: Shipped with ice packs.

Introduction:

Theranostics is a major developmental trend in modern disease diagnosis and treatment. By utilizing the unique physical, chemical and biological properties of nanomaterials, constructing nanomaterial-based integrated systems that combine diagnosis and therapy has become a core research hotspot in the medical field. Prussian blue nanoparticles feature stable structure, along with distinctive optical, enzymatic and magnetic properties and excellent biosafety. In recent years, Prussian blue nanoparticles have played critical roles in drug loading, Raman imaging, photoacoustic imaging, reactive oxygen species scavenging, photothermal therapy and other theranostic applications, attracting widespread attention from scientific researchers. Aladdin provides well-dispersed, stable, surface-functionalized and low-toxic Prussian blue nanoparticles. These products can be applied to antioxidation, tumor magnetic resonance imaging, tumor photothermal therapy and other scenarios, supporting the construction of integrated disease theranostic platforms.

Product Name	Citrate-modified Prussian Blue Nanoparticles
Hydrodynamic Size	94 nm
Surface Modifier	Citrate
Solvent	Ultrapure Water
Concentration	1 mg/mL

Product Parameters:

- Hydrodynamic Size Distribution The average hydrodynamic size is approximately 94 nm.

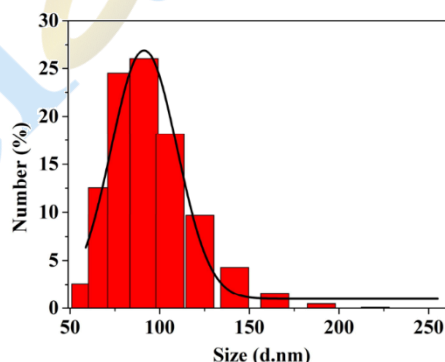


Figure 1 Hydrodynamic size distribution of Prussian blue nanoparticles.

- Zeta Potential Zeta potential: approximately -50 mV.

Web: <https://www.aladdinsci.com>

3. Electron Micrograph.

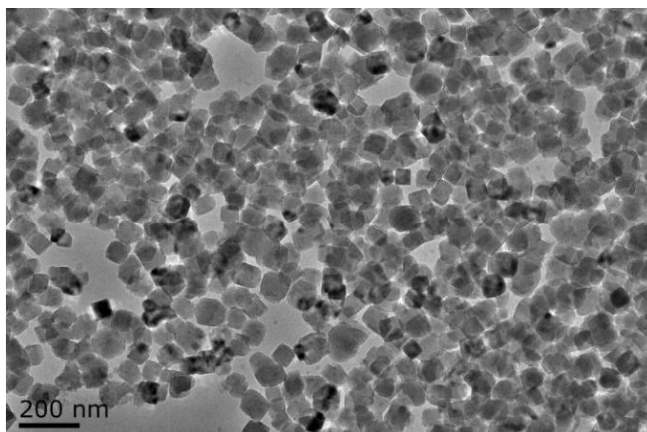


Figure 2 TEM micrograph of Prussian blue nanoparticles.

4. UV-Vis Absorption Spectrum.

Prussian blue nanoparticles show characteristic absorption at around 700 nm.

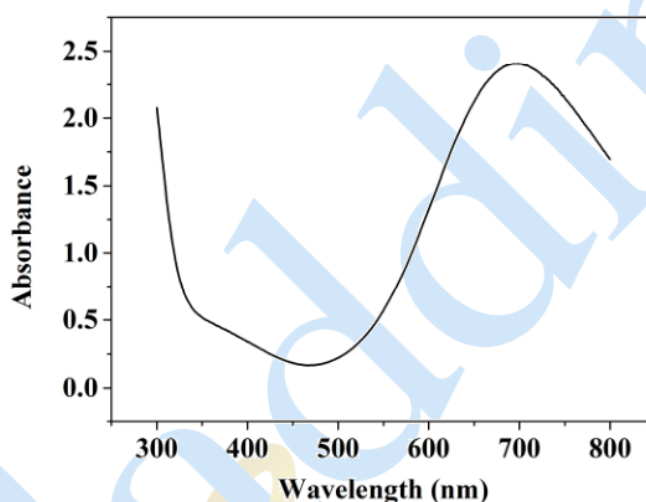


Figure 3 UV-Vis absorption spectrum of Prussian blue nanoparticles.

Functional Performance:

Experiments have confirmed that Prussian blue nanoparticles (PBNPs) possess multi-enzyme mimetic activities, including peroxidase-like, catalase-like and SOD-like activities, and can scavenge free radicals efficiently.

Experimental results verify that PBNPs can protect cells from free radical damage induced by UVA irradiation, diallyl trisulfide (DATS), lipopolysaccharide (LPS), phorbol myristate acetate (PMA) and high-glucose culture environments. They can also alleviate the injury of hippocampal neuronal cells caused by oxygen-glucose deprivation and reoxygenation. It indicates that PBNPs are promising agents for ROS scavenging, antioxidation, anti-inflammation and cerebral ischemia-reperfusion injury protection.

In an LPS-induced hepatitis animal model, PBNPs were observed to accumulate in the liver and spleen of mice, and effectively protect the liver from LPS-triggered inflammatory damage. Prussian blue nanoparticles also have outstanding photothermal effects for photothermal therapy and photoacoustic imaging. Gadolinium doping enables them to achieve magnetic resonance imaging functions. Their unique characteristic Raman signals support Raman imaging applications. Furthermore, they can serve as drug carriers to construct nano drug delivery systems.

Precautions:

1. Freeze-thaw cycles must be avoided during the use and storage of Prussian blue nanoparticles.
2. Prussian blue nanoparticles are susceptible to decomposition under alkaline conditions ($\text{pH} > 7$).