



Molybdenum Disulfide Nanoparticles, 100 nm

PRODUCT DATA SHEET

Molybdenum Disulfide Nanoparticles, 100 nm

Cat No: ABMN-100

Description

Molybdenum disulfide (MoS_2) nanoparticles, with a size of about 100 nm, have good photothermal properties and peroxide-like activity. MoS_2 nanomaterials are a class of photothermic agents with two-dimensional structure, which not only have strong and wide absorption in the near infrared region, but also have peroxidase-like activity and good biocompatibility, and are widely used in the biomedical fields of photothermal and catalytic tumor treatment, bacterial infection treatment and biosensing detection.

Abvigen can provide high quality molybdenum dioxide nanoparticles. The product has high repeatability between batches, which can meet the needs of different personalized materials such as research and development, testing and production of various customers.

For custom sizes, formulations or bulk quantities please contact our customer service department.

Website: www.abvigen.com **Phone:** +1 929-202-3014 **Email:** info@abvigenus.com

Characteristics

Type: Molybdenum Disulfide Nanoparticles

Surface: PVP

Particle size: 100 nm

Zeta potential: -49 ± 2 mV

Concentration: 1 mg/mL

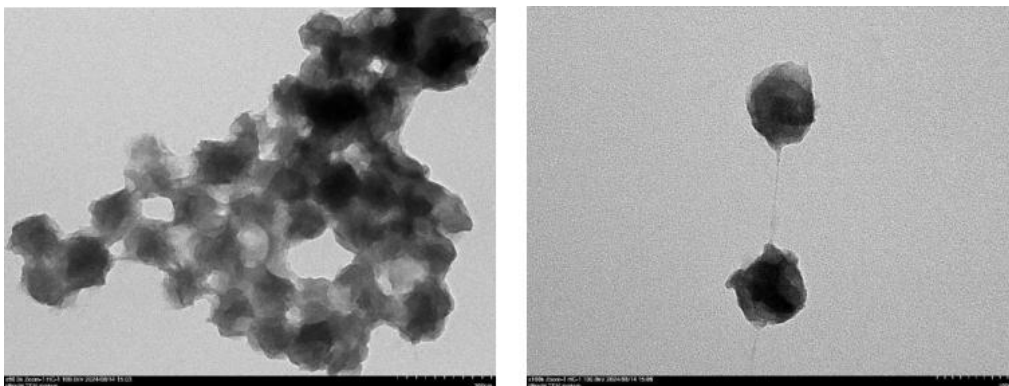
Dispersing solvent: Pure water

Storage condition: Sealed storage at 2-8°C. Do not freeze. Mix well before use.

Shelf life: 6 months

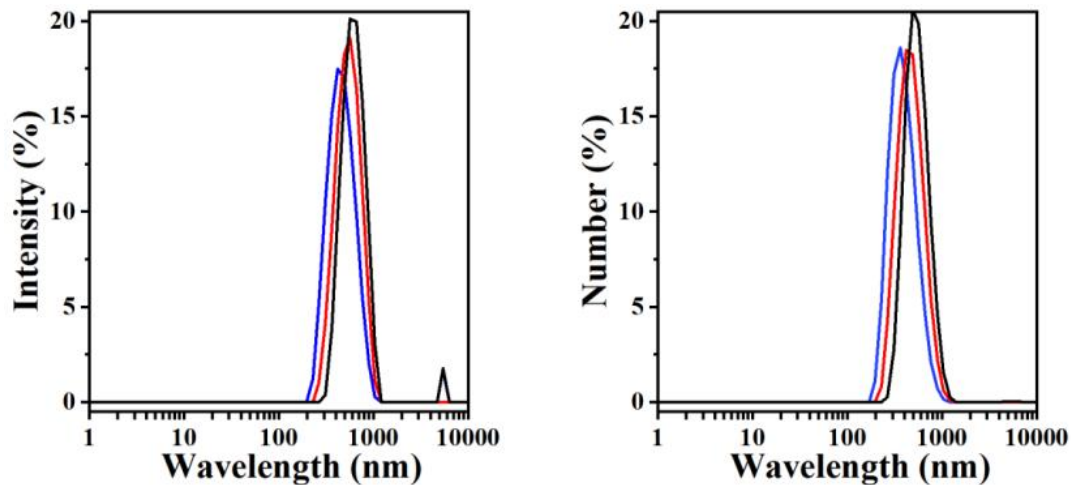
Package: Glass bottle

TEM of Molybdenum Disulfide Nanoparticles



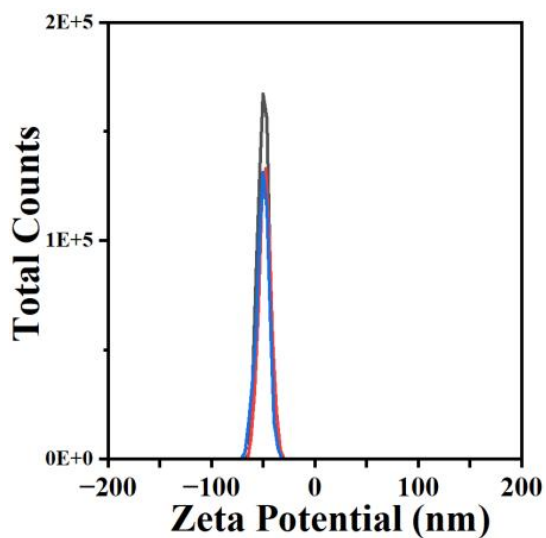
The above figure shows that the size of MoS₂ nanoparticles is relatively uniform, about 100 nm.

Hydrodynamic Dimension



It can be seen from the figure that the DLS Intensity value of MoS₂ is 554.8 nm and the Number value is 482 nm.

Zeta Potential



As shown in the figure, the Zeta value of MoS₂ NPs is -49.62 mV.

Advantages

Good photothermal performance

Peroxide-like activity

Good biocompatibility

Applications

Tumor treatment

Bacterial infection treatment

Biosensing detection

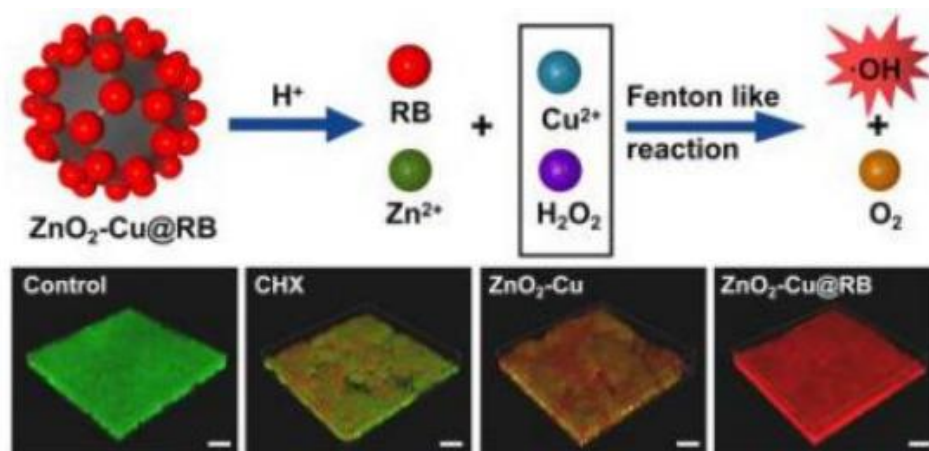
Application Example

(1) MoS₂@AIBI-PCM for the treatment of tumor (Quoted from Glutathione depletion in a benign manner by MoS₂-based nanoflowers for enhanced hypoxia-irrelevant free-radical-based cancer therapy [J]. Small, 2019, 15(51): 1904870. DOI:10.1002/smll.201904870)



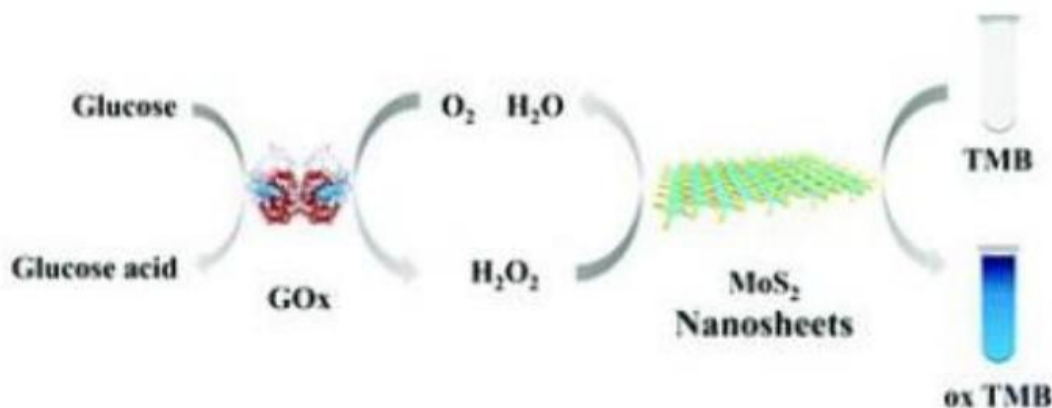
MoS₂@AIBI-PCM is a collaborative anti-tumor platform constructed by combining a pegylated molybdenum disulfide (PEG-MoS₂) nanoflower with an azo initiator and phase change material (PCM), where PCM (melting point: 39-40°C) acts as a protective phase change material in the outermost layer. Under near-infrared laser (NIR) irradiation, the photothermal characteristics of PEG-MoS₂ melt PCM and promote the decomposition of AIBI to produce free radicals. In addition, PEG-MoS₂ can promote GSH oxidation without releasing toxic metal ions, greatly promoting tumor apoptosis and avoiding the introduction of toxic metal ions.

(2) Tannic acid chelated Fe-modified molybdenum disulfide nanosheets (MoS₂@TA/Fe NSs) for the treatment of bacterial infections (Quoted from Construction of multifunctional hydrogel based on the tannic acid-metal coating decorated MoS₂ dual nanozyme for bacteria-infected wound healing [J]. Bioactive materials, 2022, 9:461-474. DOI: 10.1016/j.bioactmat.2021.07.023)



Due to the combined effect of photothermal therapy (PTT), glutathione (GSH) loss and MoS₂ peroxidase activity catalyzing hydrogen peroxide (H₂O₂) to produce hydroxyl radical, molybdenum disulphide @ tannic acid/iron nanosheets (MoS₂@TA/Fe NSs) showed excellent antibacterial activity. At the same time, benefiting from the catalase activity of TA/Fe, the hydrogel can decompose H₂O₂ into O₂ at neutral pH value, play an antioxidant role, and provide enough O₂ to relieve hypoxia and promote wound healing.

(3) MoS₂ was used in grape detection. The MoS₂-GOX-TMB detection system was constructed, and the peroxidase-like activity of MoS₂ was used to detect glucose (Quoted from Determination of glucose by using MoS₂ nanosheets as a peroxidase mimetic enzyme [J]. New Journal of Chemistry, 2021, 45(38): 18048-18053. DOI: 10.1039/d1nj03821d)



The peroxide-like enzyme (POD) activity of MoS₂ and glucose oxidase (GOx) were used to construct a catalytic system for the detection of glucose using TMB as substrate. GOx catalyzes glucose into gluconic acid and hydrogen peroxide (H₂O₂). Under acidic environment, MoS₂ has Pod-like activity to catalyze H₂O₂ to produce hydroxyl radical (\cdot OH), and \cdot OH oxidizes TMB to the oxidation state TMB (oxTMB). oxTMB and TMB combine to form blue substance for colorimetric detection of glucose.

Storage

Sealed stored at 2-8°C away from light for 6 months.

Note

Use after ultrasonic dispersion.



Ordering Information

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