

Product Data Sheet

Product Name: UiO-66-NH₂

Cat. No.: GB61960

Chemical Properties

Cas. No. 1260119-00-3

Formula C₄₈H₃₄N₆O₃₂Zr₆

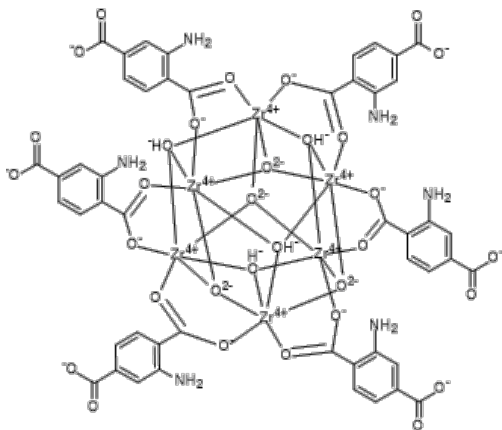
M.Wt 1754.15

Solubility Storage 2-8°C, stored under nitrogen

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice. All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

Synthesis of UiO-66-NH₂@siRNA and EVs@UiO-66-NH₂@siRNA^[1]

This protocol is adapted from research data and provided for reference only. Adjustments may be necessary based on specific experimental requirements.

1. Preparation of UiO-66-NH₂@siRNA: Mix 1mg of UiO-66-NH₂ with 500nM of siRNA and dissolve in 4mL of DEPC water. Stir the mixture at room temperature for 24 hours. Subsequently, centrifuge the solution at 8000rpm for 10 minutes, and wash the precipitate three times with DEPC water. Dry the washed sample in a vacuum oven at 65°C for 12 hours to obtain UiO-66-NH₂@siRNA nanoparticles.
2. Preparation of EVs@UiO-66-NH₂@siRNA: Mix UiO-66-NH₂@siRNA nanoparticles (1mg/mL) with

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extracellular vesicles (0.5mg/mL), ultrasonicate for 30 minutes, and then extrude sequentially through porous polycarbonate membranes with pore sizes of 800nm, 400nm, 200nm, and 100nm. Centrifuge the resulting solution at 12,000rpm for 5 minutes and collect the precipitate. Resuspend the EVs@UiO-66-NH₂@siRNA nanoparticles in PBS and store at 4°C for later use.

Precautions:

- (1) UiO-66-NH₂ is activated in a 150°C (vacuum) oven for 3 hours before use
- (2) UiO-66-NH₂ nanoparticles possess high porosity, large specific surface area, and acid sensitivity, which can increase the loading capacity of siRNA and enhance its escape efficiency from lysosomes.
- (3) For your safety and health, please wear a lab coat and disposable gloves during operation.

References:

- [1] Cui C, Tang J, Chen J, et al. Lactobacillus acidophilus extracellular vesicles-coated UiO-66-NH₂@siRNA nanoparticles for ulcerative colitis targeted gene therapy and gut microbiota modulation. J Nanobiotechnology. 2025 Apr 17;23(1):301.

Background

UiO-66-NH₂ is an amino-functionalized zirconium-based metal-organic framework material. UiO-66-NH₂ provides abundant chemical active sites through the amino functional groups on its surface, enabling selective adsorption of heavy metal ions and organic pollutants via hydrogen bonding, electrostatic interactions, and coordination. The amino modification can also regulate the material's acidity/basicity and optical properties, and UiO-66-NH₂ is used to stabilize metal nanoparticles. UiO-66-NH₂ can be applied in research related to gas adsorption and separation, water treatment, catalysis, drug carriers, biosensing, precious metal recovery, and solid-state battery electrolytes^[1-4].

References:

- [1] Lin X, Xiong Y, Dong F. Sodium Alginate/UiO-66-NH₂ Nanocomposite for Phosphate Removal. Nanomaterials (Basel). 2024 Jul 10;14(14):1176.
- [2] Lin KA, Liu YT, Chen SY. Adsorption of fluoride to UiO-66-NH₂ in water: Stability, kinetic, isotherm and thermodynamic studies. J Colloid Interface Sci. 2016 Jan 1;461:79-87.
- [3] Pan J, Gao D, Li L, et al. Silane-networked UiO-66-NH₂ enabled high-performance composite proton exchange membrane in water electrolysis. J Colloid Interface Sci. 2026 Jan;701:138700.
- [4] Timofeev KL, Kulinich SA, Kharlamova TS. NH₂-Modified UiO-66: Structural Characteristics and Functional Properties. Molecules. 2023 May 5;28(9):3916.

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