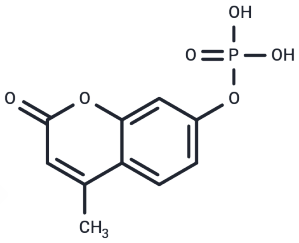
Data Sheet (Cat.No.T18888)

TargetMol

4-Methylumbelliferyl phosphate

Chemical Properties



CAS No. : 3368-04-5

Formula: C10H9O6P

Molecular Weight: 256.15

Storage: Keep away from direct sunlight,Store at low temperature
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	4-Methylumbelliferyl phosphate (4-MUP) (4-MUP) is used as a fluorogenic substrate of alkaline phosphatases.
Targets(IC50)	Others,Phosphatase
In vitro	4-Methylumbelliferyl phosphate has a significant advantage over currently available substrates in that its useful concentration range extends to about 0.1 μM. If the concentration of 4-Methylumbelliferyl phosphate is held constant and the pH is varied, the activity of the enzyme passes through a maximum.
Cell Research	I. Alkaline phosphatase activity detection 1. Preparation of 4-MUP solution: Dissolve 4-MUP in an appropriate buffer, such as Tris-HCl (pH 8.0), with a concentration generally between 0.1-1 mM. 2. Add sample: Add a sample containing alkaline phosphatase (such as serum or cell lysate) to the 4-MUP solution. Adjust the final reaction volume according to the desired sensitivity. 3. Incubate the reaction system at 37°C, usually for 30 minutes to 1 hour, to allow the enzyme to dephosphorylate 4-MUP. 4. Fluorescence measurement: After incubation, measure the fluorescence of 4-methylumbelliferone by a fluorescence spectrophotometer or microplate reader, with an excitation wavelength of 360 nm and an emission wavelength of 450 nm. 5. Data analysis: The fluorescence intensity is proportional to the activity of alkaline phosphatase. By comparing with the standard curve, the enzyme activity in the sample can be quantified. II. Application in Enzyme-Linked Immunosorbent Assay (ELISA) 1. Plate coating: Coat the antigen or antibody of interest on the microplate. 2. Add alkaline phosphatase-labeled antibody: Add the antibody or enzyme-labeled probe linked to alkaline phosphatase. 3. Add substrate: Add 4-MUP substrate after washing. 4. Fluorescence detection: After incubation, measure the fluorescence signal using a microplate reader or fluorescence plate reader with an excitation wavelength of 360 nm and an emission wavelength of 450 nm. 5. Result interpretation: Quantify the amount of antigen or antibody based on the fluorescence intensity.

Cell Research	III. Alkaline phosphatase detection in cell culture 1. Cell treatment: Culture cells in appropriate culture medium and treat as needed. 2. Add 4-MUP: Add 4-MUP solution to the cell culture medium. 3. Fluorescence monitoring: After incubation, use a fluorescence microscope or microplate reader for fluorescence measurement. 4. Quantitative analysis: Quantify enzyme activity by fluorescence intensity to evaluate changes in alkaline phosphatase during treatment or differentiation. IV. Alkaline phosphatase detection in tissue sections 1. Tissue section preparation: Prepare tissue sections using conventional histological methods. 2. Add 4-MUP: Soak the sections in 4-MUP solution, usually incubated at 37°C. 3. Fluorescence microscopy observation: After incubation, use a fluorescence microscope to observe the fluorescence signal. 5. Analysis: Evaluate the activity of alkaline phosphatase by observing the fluorescence distribution and intensity in the tissue. The above information is based on published literature. Experimental procedures should be appropriately modified to meet specific research demands.

Solubility Information

Solubility	H2O: 20 mg/mL (78.08 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	3.904 mL	19.5198 mL	39.0396 mL
5 mM	0.7808 mL	3.904 mL	7.8079 mL
10 mM	0.3904 mL	1.952 mL	3.904 mL
50 mM	0.0781 mL	0.3904 mL	0.7808 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

Li Y,et al. Ratiometric fluorescent probe and smartphone-based visual recognition for H2O2 and organophosphorus pesticide based on Ce3+/Ce4+ cascade enzyme reaction. Food Chem. 2025 Mar 30;469: 142577.

He Y, et al. Ratiometric fluorescent detection of total phosphates in frozen shrimp samples using catalytic active Zr (IV) modified gold nanoclusters. Food Chem. 2023 Nov 15;426:136564.

Oh KH, et al. Assessing the microcystins concentration through optimized protein phosphatase inhibition assay in environmental samples. J Microbiol. 2022 Jun;60(6):602-609.

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