

Product Data Sheet

Product Name: 4-Methylumbelliferyl- β -D-Galactoside

Cat. No.: GC49114

Chemical Properties

Cas. No. 6160-78-7

SMILES CC(C1=CC=C(O[C@@H]2O[C@@H]([C@@H]([C@@H]([C@H]2O)O)O)CO)C=C1O3)=CC3=O

Formula C₁₆H₁₈O₈

M.Wt 338.3

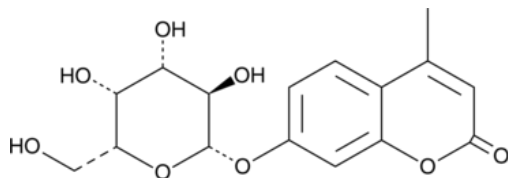
Solubility 50 mg/ml in DMSO (Need ultrasonic), Ethanol: slightly soluble, Methanol: slightly soluble

Storage Store at -20°C

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

Experimental protocol for β -galactosidase activity detection based on 4-Methylumbelliferyl- β -D-Galactoside

This experimental protocol is derived from the literature. Please make modifications according to your specific requirements.

1. Solution preparation

(1) Substrate solution:

2.5mg of 4-methylumbelliferyl- β -D-galactoside was weighed and dissolved in 1ml of citrated acid-sodium phosphate buffer (pH 4.5), stored in the dark at 4°C, and prepared immediately for use.

Caution: Product has not been fully validated for medical applications. For research use only.

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(2) 4-methylumbelliferone (4-MU) reference material Solution series:

Stock solution A (1mM): 4-MU 1.98mg dissolved in 10ml distilled water and diluted to different concentrations: 0, 0.1, 0.5, 1, 5, 10 μ M.

(3) Reaction buffer:

Citrate-sodium phosphate buffer (50mM, pH 4.5) containing 0.45% NaCl.

2. Sample preparation

Jurkat cells were harvested, washed twice with PBS, added cell lysate, lysed at 4°C for 30min, centrifuged at 12,000rpm for 10min, and the supernatant was removed for protein quantification.

3. Enzyme Assay:

The enzymatic reaction was initiated by mixing:

(1) 250 μ l lysed cell suspension with 0.1% albumin (220 μ l cell suspension in PBS lysed immediately after adding 30 μ l cell lysis buffer).

(2) 750 μ l 4-Methylumbelliferyl- β -D-Galactoside in 50mM citrate-phosphate buffer, pH 4.5 with 0.45% NaCl. The final substrate concentration in the reaction mixture was 0.8mM.

(3) The mixture was incubated at 37°C for 30min. After the time, the enzymatic reaction was terminated by adding 10ml 100mM glycine-NaOH buffer, pH 10.7. The same protocol was used for the blank mixture.

(4) The relative fluorescence (excitation 365nm, emission 445nm) was measured using a spectrofluorimeter. The results were compared with a 4-MU standard curve. The enzymatic activity was expressed as μ U per number of cells, where U is the amount of enzyme that catalyzes the conversion of 1 μ M of substrate per 1min.

References:

[1] Kwapiszewski R, Szczudlowska J, Kwapiszewska K, et al. Determination of acid β -galactosidase activity: methodology and perspectives[J]. Indian Journal of Clinical Biochemistry, 2014, 29(1): 57-62.

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4-Methylumbelliferyl- β -D-Galactoside is a fluorescent substrate that is used for the enzyme release assay to detect human NK cell activity^[1]. 4-Methylumbelliferyl- β -D-Galactoside is hydrolyzed during the enzymatic reaction, and the released 4-methylumbelliferone could be quantified by fluorometry^[2]. 4-Methylumbelliferyl- β -D-Galactoside can act as the substrate for rapid detection of total and fecal coliform bacteria (TC and FC) in drinking water^[3]. 4-Methylumbelliferyl- β -D-Galactoside is currently used to develop a series of highly sensitive assays to probe β -D-galactoside activity in cells^[4].

References:

- [1] Ohmori H, Ikeda H, Tanigawa T, et al. Enzyme release assay of human NK cell activity using β -galactosidase-expressing K562 target cell line[J]. Journal of immunological methods, 1993, 164(1): 131-135.
- [2] Hattenberger M, Mascher F, Kalcher K, et al. Improved method for the fluorimetric detection of β -D-galactosidase in water[J]. International journal of hygiene and environmental health, 2001, 203(3): 281-287.
- [3] Berg J D, Fiksdal L. Rapid detection of total and fecal coliforms in water by enzymatic hydrolysis of 4-methylumbelliferone-beta-D-galactoside[J]. Applied and environmental microbiology, 1988, 54(8): 2118-2122.
- [4] Ramsay J P. High-throughput β -galactosidase and β -glucuronidase assays using fluorogenic substrates[J]. Bio-protocol, 2013, 3(14): e827-e827.

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