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ProductInformation

4-Methylumbelliferyl-β-D-galactopyranoside

Product Number **M 1633**
Storage Temperature -0 °C

Product Description

Molecular Formula: $C_{16}H_{18}O_8$
Molecular Weight: 338.3
CAS Number: 6160-78-7
Melting Point: 227.5-230 °C[1]
Specific Rotation: -37° (1.23% (w/v) in dimethylformamide)
Extinction Coefficient: E^{mM} = 13.49 (315 nm, methanol)[1]
Synonyms: MUG; MUGal

MUGal is used as a substrate for β-D-galactosidase activity. When MUGal is used as a substrate for β-galactosidase, the released methylumbelliferone is monitored at 445 nm when excited at 365 nm.[1] This substrate has been used to assay β-galactosidase from kidney[2] and liver.[3-5]

MUGal is more sensitive and economical to use with bacteria than X-gal.[6] The product can be used in selecting bacteria for β-galactosidase activity by including it in the agar at a final concentration of about 400 μg/ml.[6] If the substrate were included directly in the agar, its hydrolysis over the time necessary for a colony to develop produces a high level of background fluorescence throughout the plate. MUGal can also be applied by spraying plates or pouring overlays with the substrate at 400 μg/ml in soft agar. MUGal can be dissolved in DMSO at a concentration of 10 mg/ml, then sprayed on a culture plate (0.2 ml per plate).[6]

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

This product is soluble in pyridine (10 mg/ml) and DMF (12 mg/ml), yielding a clear, colorless to faint yellow solution. It is also slowly soluble (5 minutes) in DMSO (115 mg/ml) to yield a clear solution. It is not soluble in 95% ethanol (27 mg/ml) or water (4.6 mg/ml).

In water, the solubility limit is 0.21 mg/ml (24 °C) and 0.16 mg/ml (3 °C). When tested for solubility in 0.1 M phosphate buffer, pH 7.3, at 0.5 mg/10 ml (the concentration used with the material is tested as a substrate for β-galactosidase), it had to be warmed and sonicated to get it into solution.

References

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3. Miller, A. L., et al., Purification of human liver acid β-galactosidases using affinity chromatography. Anal. Biochem., **74** 537-545 (1976).
4. Holmes, E. W. and O'Brien, J. S., Purification and Properties of Acid β-Galactosidase from Feline Liver. Biochem., **18(6)** 952-958 (1979).
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6. Youngman, P. Detection of *Tn917*-mediated *lacZ* fusions with MUG. Plasmids: A Practical Approach, 1st.ed., Hardy, K. G., ed., IRL Press, Oxford-Washington (1987), pp. 95-98.

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