

Product Information

Digitonin

Product Number **D5628**
Store at Room Temperature

Product Description

Molecular Formula: $C_{56}H_{92}O_{29}$
Molecular Weight: 1229
CAS Number: 11024-24-1
Specific Rotation: -47 TO -49° (10 g/100 ml 75%
Acetic Acid at 25 °C)¹
The aggregation number for digitonin is 60.

Commercial digitonin is a mixture consisting of about five glycosides. The main components of this mixture are digitonin, a pentasaccharide derivative of steroidal aglycon digitogenin and digaloinin, a saponin of similar structure,⁵ in which the 2-hydroxy digitogenin is missing.

Commercial preparations of digitonin cannot be used directly, because even the best preparations contain 30-50% material that cannot be dispersed evenly in water, and the effects of unpurified digitonin are unpredictable. Commercial digitonin may be purified by recrystallization.² The following method of purification is recommended. Dissolve 6 g of commercial digitonin in 150 ml of absolute ethanol at 75 °C. Digitonin is precipitated by chilling the solution at 0 °C (ice water) for 20 minutes and then separated by centrifugation at 4 °C. This procedure is repeated twice, resulting in approximately 60% recovery (3.5 g), obtained after vacuum drying. This grade of digitonin can be readily dispersed in water (2.5 mg/ml), yielding a clear apparent solution that will become turbid after 1-2 hours standing, thus, only fresh solutions should be used.² A cholesterol extraction method has also been used to make pure digitonin preparations.⁶

The purified material, when used for the isolation of submitochondrial particles, is about twice as effective in solubilizing mitochondrial membranes as unpurified commercial preparations. Purified digitonin/protein ratios should be appropriately diminished (i.e., 0.65 mg of purified digitonin per 10 mg of mitochondrial protein to remove the outer membrane). It is suggested to use approximately 0.25 mg of digitonin per gram tissue (wet weight). The purified digitonin is dissolved in the homogenizing medium (2.5 mg/mL) and is added as 0.1 ml/g of original tissue weight.

A 1% working solution of this product is used in solubilizing membranes.³

Precautions and Disclaimer

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

Preparation Instructions

Digitonin is soluble in ethanol at 10 mg/ml.

References

1. USP, **21**, p. 1377.
2. Kun, E., et al., Stabilization of Mitochondrial Functions with Digitonin. *Methods in Enzymol.*, **55**, 115-118 (1979).
3. Niznik, H. B., et al., The Dopamine D1 Receptor: Partial Purification of a Digitonin-solubilized Receptor-guanine Nucleotide Binding Complex, *Biochem. Pharmacol.*, **35(17)**, 2974-2977 (1986).
4. Merck Index, 9th ed., Entry# 3137.
5. Fukunaga, K., et al., 2-Hydroxypropyldigitonin: Synthesis and Properties of Preparations Differing in Degree of Substitution, *J. Pharm. Sci.*, **77(7)**, 640-642 (1988).
6. Janski, A. M., and Cornell, N. W., Subcellular Distribution of Enzymes Determined by Rapid Digitonin Fractionation of Isolated Hepatocytes. *Biochem. J.*, **186(2)**, 423-429 (1980).

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