

# TREHALOSE

*New specifications prepared at the 55th JECFA (2000) and published in FNP 52 Add 8 (2000). An ADI "not specified" was established at the 55th JECFA (2000).*

## SYNONYMS

alpha,alpha-trehalose

## DEFINITION

A non-reducing disaccharide consisting of two glucose moieties joined together by an alpha-1,1 glucosidic bond. It is made from liquefied starch by a multistep enzymatic process. The commercial product is the dihydrate.

Chemical names

alpha-D-glucopyranosyl-alpha-D-glucopyranoside, dihydrate

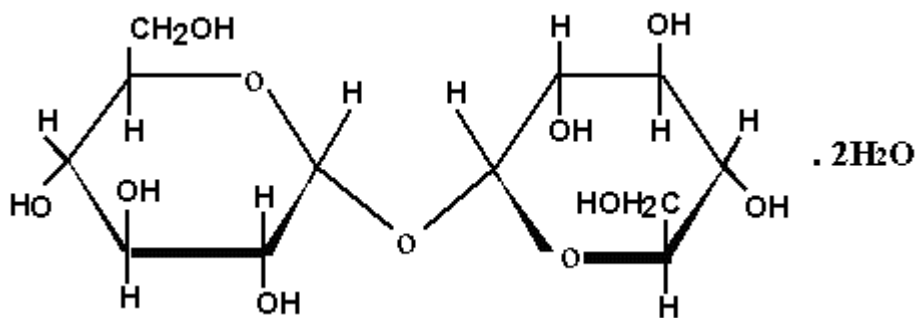
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6138-23-4

Chemical formula

$C_{12}H_{22}O_{11} \cdot 2H_2O$

Structural formula



Formula weight

378.33

Assay

Not less than 98% on the dry basis

## DESCRIPTION

White or almost white crystals

**FUNCTIONAL USES** Texturizer, stabilizer, humectant, sweetener

## CHARACTERISTICS

### IDENTIFICATION

Solubility (Vol. 4)

Soluble in water, slightly soluble in ethanol

Specific rotation (Vol. 4)

alpha (20, D): +199° (5% aqueous solution)

Melting point (Vol. 4)

97°

### PURITY

Loss on drying (Vol. 4)

Not more than 1.5% (60°, 5h)

Total ash (Vol. 4)

Not more than 0.05%

Lead (Vol. 4)

Not more than 1mg/kg

Determine using an atomic absorption technique appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the method described in Volume 4, "Instrumental Methods."

## **METHOD OF ASSAY**

Determine by liquid chromatography using the following conditions.

### Sample preparation

Weigh accurately about 3g of dry sample into a 100ml volumetric flask and add about 80 ml of deionized water. Bring sample to complete dissolution and dilute to mark with deionized water. Filter through a 0.45 micron filter.

### Preparation of standard solution

Dissolve accurately weighed quantities of dry standard reference trehalose (available from Hayashibara Co., Ltd, 2-3 Shimoishii 1-chome, Okayama 700, Japan) in water to obtain a solution having known concentration of about 30 mg of trehalose per ml.

### Apparatus

Liquid chromatograph equipped with a refractive index detector and an integrating recorder.

### Conditions

Column and packing : Shodex Ionpack KS-801 or equivalent

-length : 300mm

-diameter : 10mm

-temperature : 50°C

Mobile phase : water

Flow rate : 0.4 ml/min

Injection volume : 8µl

### Procedure

Separately inject equal volumes of the sample solution and the standard solution into the chromatograph. Record the chromatograms and measure the response of the trehalose peak. Calculate the quantity in mg of trehalose in 1 ml of the sample solution by the following formula:

$$\% \text{ trehalose} = 100 \times (R_U / R_S) (W_S / W_U)$$

where

$R_S$  = Peak area of trehalose in the standard preparation

$R_U$  = Peak area of trehalose in the sample preparation

$W_S$  = Weight in mg of trehalose in the standard preparation

$W_U$  = Weight of dry sample in mg