# THAUMATIN

*Prepared at the 53rd JECFA (1999) and published in FNP 52 Add 7 (1999), superseding tentative specifications prepared at the 51st JECFA (1998), published in FNP 52 Add 6 (1998). ADI "not specified", established at the 29th JECFA in 1985.*

**SYNONYMS** INS No. 957

**DEFINITION** Obtained by aqueous extraction (pH 2.5-4.0) of the arils of the fruit of *Thaumatococcus daniellii* (Benth); consists essentially of the proteins Thaumatin I and Thaumatin II together with minor amounts of plant constituents derived from the source material.

C.A.S. number 53850-34-3

Formula weight Thaumatin I: 22,209
Thaumatin II: 22,293

Assay Not less than 15.1% nitrogen on the dried basis equivalent to not less than 93% protein (N x 6.2)

**DESCRIPTION** Odourless, cream-coloured powder

**FUNCTIONAL USES** Sweetener, flavour enhancer

**CHARACTERISTICS**

IDENTIFICATION

Solubility (Vol. 4) Very soluble in water; insoluble in acetone

Ninhydrin test To 5 ml of a 1 in 1000 ml solution of the sample add 1 ml of freshly prepared triketohydrine hydrate (ninhydrin) solution (dissolve 200mg of triketohydrine hydrate in water and dilute to 100 ml). A bluish colour is produced.

Infrared absorption The infrared spectrum of a potassium bromide dispersion of the sample (1-2 mg of sample ground in a mortar with 100-200 mg potassium bromide) corresponds to the infrared spectrum below. Characteristic maxima of absorption are shown at the following wavenumbers: 3300, 2960, 1650, 1529, 1452, 1395, 1237, 1103 and 612 $cm^{-1}$

PURITY

Loss on drying (Vol. 4) Not more than 9.0% (105° to constant weight)

Spectrophotometry (Vol. 4) The specific absorption, $A^{1\%}_{1\ cm}$ at the wavelength of maximum absorption (about 279 nm) shall be not less than 11.5 and not more than 13.0 determined on the dried basis and using a 1 in 100 w/v solution of the sample in water at pH 2.7.

Sulfated ash (Vol. 4) Not more than 2.0% on the dried basis

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| Carbohydrates | Not more than 3.0% on the dried basis<br>See description under TESTS |
| Microbiological criteria (Vol. 4) | Total aerobic plate count: Not more than 1000 cfu/g<br>*E. coli*: Negative in 1 g |
| Aluminium | Not more than 100 mg/kg<br>Determine by atomic absorption spectroscopy (Vol. 4) |
| Lead (Vol. 4) | Not more than 3 mg/kg<br>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.” |

## TESTS

PURITY TESTS

Carbohydrates

Reagent:
cysteine-sulfuric acid
Mix immediately before use 0.5 ml of 3% w/v aqueous solution of L-cysteine hydrochloride monohydrate and 25 ml of 86% v/v sulfuric acid. Cool in ice. Do not store for reuse.

Procedure
Dissolve 0.2 g of sample, accurately weighed, in water and make up to 100 ml. Place a 0.2-ml portion in a very clean dust-free glass tube and cool in an ice-bath. Add 1.2 ml of ice-cold cysteine-sulfuric reagent, cover with a glass ball, and mix thoroughly. After 2 min in ice, remove to room temperature for 3 min, then plunge into a boiling water bath for 3 min. Immediately cool in ice for 5 min, before reading the absorbance in a 1-cm cell at 412 nm.

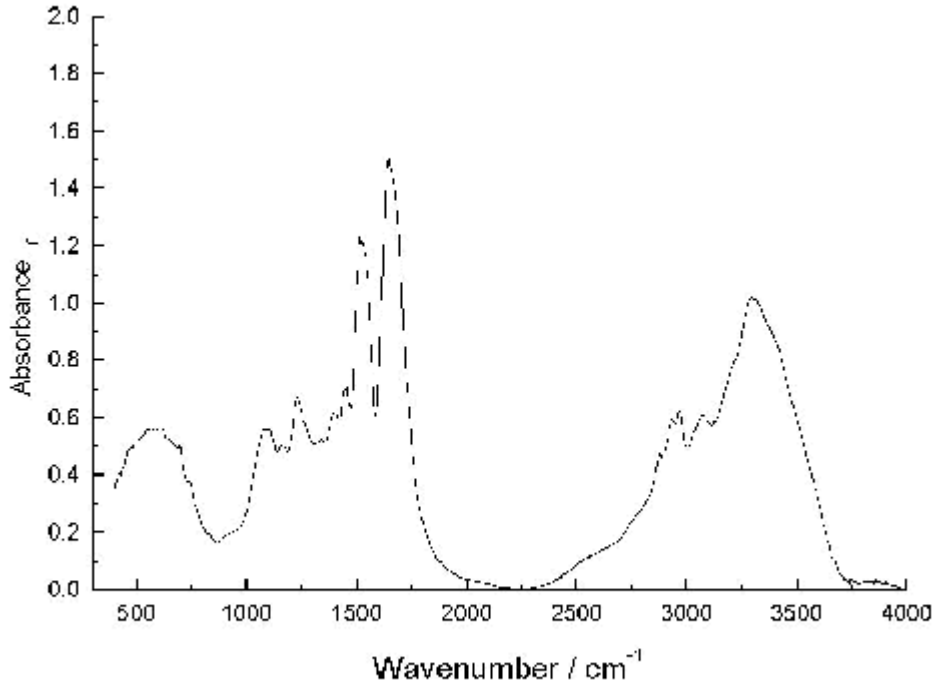
Standard curve
Prepare standard glucose solutions ranging in concentration from 10 -100 µg/ml and construct a standard curve from the absorbance of these solutions following treatment of 0.2 ml samples according to the above procedure.

Determine the carbohydrate concentration (as glucose) in the test sample by reference to the standard curve.

## METHOD OF ASSAY

Proceed as directed under Nitrogen Determination (Kjeldahl Method; Volume 4), Method II.

Infrared spectrum — Thaumatin


Absorbance
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
500
1000
1500
2000
2500
3000
3500
4000
Wavenumber / cm-1