

# Statement of measurement



4005

## Fruit Squash –Total SO<sub>2</sub>

Reference Material LGC7113

### Assessed value

Constituent	Number of laboratories	Assessed value <sup>1,2</sup> mg/L	Uncertainty <sup>3</sup> mg/L
Total Sulfur Dioxide	10	255	41

#### Notes:

1. The assessed value was obtained through an inter-laboratory study where participants used a variety of methods.
2. The value is traceable to the SI through the physical and chemical standards used by the inter-laboratory study participant laboratories.
3. The uncertainty quoted is the half-width of the expanded uncertainty interval calculated using a coverage factor of 2.26, providing a level of confidence of approximately 95 %.

Date of Issue: October 2020  
Latest certificate revision June 2022

Signed: \_\_\_\_\_  
Gill Holcombe (Mrs)  
for the Government Chemist



## Material Preparation

The material was prepared using a commercially sourced cranberry and raspberry squash containing a base level of total SO<sub>2</sub> at 120 mg/L. The contents of approximately 50 bottles were combined in a plastic carboy, thoroughly mixed and then the material was spiked with sodium metabisulfite to give a final concentration of approximately 240 mg/kg. The solution was thoroughly mixed and dispensed in 55 mL portions into 60 mL amber glass bottles with tamper-evident screw caps, then stored frozen at (-80 +40/-10) °C.

## Homogeneity Assessment

The material was tested for between-bottle homogeneity by analysing randomly selected units from across the fill run. The homogeneity data for total SO<sub>2</sub> was examined and deemed fit-for-purpose. The volume of the material taken for the homogeneity assessment was 5 mL, which was diluted 1:1 with deionised water and 100 µL of the diluted solution used for analysis.

An uncertainty contribution from the homogeneity assessment was incorporated into the combined uncertainty figure.

## Stability

Deterioration of the material is not anticipated over its lifetime when stored under the recommended conditions. The uncertainty associated with long-term instability was considered to be negligible compared with the uncertainty contributions from characterisation and possible inhomogeneity, and was therefore assigned a value of zero.

The material will be monitored at LGC and customers will be notified of any changes in the assessed value.

## Characterisation

The assessed value for this material was calculated by LGC using the results of an inter-laboratory characterisation study. Laboratories were given a free choice of method, but asked to use one with which they were familiar. All laboratories had ISO/IEC 17025 testing accreditation for the determination of SO<sub>2</sub> in foods.

The assessed value is based on the H15 mean<sup>[1]</sup>. The uncertainty was calculated by combining the uncertainty calculated from the inter-laboratory exercise with a contribution from any possible heterogeneity identified in the homogeneity assessment, and then expanded using a coverage factor of 2.26, to provide a level of confidence of approximately 95 %.

The density of the material, as measured by LGC, is 1.17 g/cm<sup>3</sup>.

## Methods used by Participating Laboratories

Techniques used in the characterisation of this material are summarised below:

Procedures used in more than one laboratory	Acid reflux, collection of SO <sub>2</sub> in hydrogen peroxide, titration of sulfuric acid released with sodium hydroxide solution. (Tanner method)
	Monier Williams / modified Monier Williams method
Procedures used in only one laboratory	Acid reflux, collection of SO <sub>2</sub> in water, titration with iodine solution.

## Accreditation

The property value on this statement of measurement is within LGC's scope of accreditation to ISO 17034 as a reference material producer.

## Intended Use

This material is intended for use in the development, validation or quality control of analytical methods for the determination of total SO<sub>2</sub> in beverages. The material may also be applicable to other similar matrices where more closely matched reference materials are not available.

## Instructions for Use

The material should be thawed before analysis and used within 24 hours. If thawing overnight, use a refrigerator. Invert bottle to mix well before use. Analyse immediately once opened and discard any remaining material.

The minimum amount of sample to be taken from the thawed unit is 5 mL. This can then be diluted and used in smaller quantities as necessary.

## Storage Conditions and Shelf Life

This material should be stored at -20 °C or below, preferably at -80 °C. Provided the sample is stored unopened under the recommended conditions, the assessed value will remain valid for 3 months from the date of shipment (see Page 4).

## Metrological Traceability

The assessed values are considered to be traceable to the SI through the physical and chemical standards used by the participants in the inter-laboratory study. All labs were accredited to ISO/IEC 17025.

## Participants in the Inter-laboratory Study

The following laboratories took part in the inter-laboratory study for this material.

Eurofins Bel/Novamann s.r.o	Slovakia
Glasgow Scientific Services	UK
Kent Scientific Services	UK
National Institute for Food Control	Vietnam
Public Analyst's Laboratory, Cork	Ireland
Public Analyst's Laboratory, Dublin	Ireland
Public Analyst's Laboratory, Galway	Ireland
Reading Scientific Services	UK
Tayside Scientific Services	UK
Worcestershire Scientific Services	UK

## Reference

[1] Huber, P. (1981). Robust Statistics. Wiley

## Certificate Revision

The certificate was revised in June 2022 to reflect an update to the UKAS symbol.

Unit Number

Date of Shipment

### Legal Notice

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