

NITROGEN

Prepared at the 53rd JECFA (1999) and published in FNP 52 Add 7 (1999), superseding specifications prepared at the 51st JECFA (1998), published in FNP 52 Add 6 (1998). ADI "No ADI necessary" established at the 24th JECFA in 1980.

SYNONYMS

INS No. 941

DEFINITION

This monograph defines nitrogen with a maximum oxygen content of 1%, which is suitable only for some food applications. There are food applications that require a higher purity (i.e., lower oxygen content).

Chemical names

Nitrogen

C.A.S. number

7727-37-9

Chemical formula

N₂

Formula weight

28.0

Assay

Not less than 99.0% v/v

DESCRIPTION

Colourless, odourless gas or liquid

FUNCTIONAL USES Freezing agent, propellant, packaging gas

CHARACTERISTICS

IDENTIFICATION

Flame test

A flame is extinguished in an atmosphere of the sample

PURITY

Oxygen

As declared by the vendor but not more than 1% v/v
See description under TESTS

Carbon monoxide

Not more than 10 µl/l
See description under TESTS

TESTS

PURITY TESTS

Oxygen

Use an oxygen analyser with a detector scale ranging from 0 µl/l to 100 µl/l and equipped with an electrochemical cell. The gas to be examined is passed through a detection cell containing an aqueous solution, generally potassium hydroxide. Oxygen in the sample gas produces variation in the electrical signal recorded at the outlet of the cell that is proportional to the oxygen content.

Calibrate the analyzer according to the instructions of the manufacturer.

Pass the gas through the analyser using a suitable pressure regulator and airtight metal tubes and operating at the prescribed flow-rates until constant readings are obtained.

Carbon monoxide

Pass 1050 ± 50 ml of the gas sample through a carbon monoxide detector tube at the rate specified for the tube. The indicator change corresponds to not more than 10 µl/l.

METHOD OF ASSAY

Determine by Gas chromatography using the following conditions:

Column:

- material: stainless steel
- length: 2 m
- internal diameter: 2 mm
- packing material: appropriate molecular sieve capable of absorbing molecules with diameters up to 0.5 nm.

Carrier:

- gas: helium (not less than 99.995 % (v/v) of He)
- flow: 40 ml/min

Detector: thermal conductivity detector

Injector: loop injector

Column temperature: 50°

Detector temperature: 130°

Reference gas (a): ambient air

Reference gas (b): Nitrogen (not less than 99.999 % (v/v) of N₂, less than 1 ppm CO, less than 5 ppm O₂)

Procedure:

Inject reference gas (a). Adjust the injected volumes and operating conditions so that the height of the peak due to nitrogen in the chromatogram is at least 35 % of full scale of the recorder. The assay is not valid unless the chromatograms obtained show a clear separation of oxygen and nitrogen.

Inject the gas to be examined and the reference gas (b). In the chromatogram obtained with the gas to be examined, the area of the principal peak is at least 99.0 % of the area of the principal peak in the chromatogram obtained with reference gas (b).