

ARGON

New specifications prepared at the 53rd JECFA (1999) and published in FNP 52 Add 7 (1999).

SYNONYMS INS No. 938

DEFINITION

Chemical names Argon

C.A.S. number 7440-37-1

Chemical formula Ar

Formula weight 40.0

Assay Not less than 99.0% by volume

DESCRIPTION Colourless and odourless gas

FUNCTIONAL USES Packaging gas

CHARACTERISTICS

IDENTIFICATION

Flame test The flame of a burning splinter of wood is extinguished when inserted into an upright test tube filled with argon

PURITY

Water Passes test
See description under TESTS

Oxygen, nitrogen, hydrogen Not more than 1.0% in combination
See description under TESTS

Odour Carefully open the container valve to produce a moderate flow of gas. Do not direct the gas stream toward the face, but deflect portion of the stream toward the nose: no appreciable odour is discernible

TESTS

PURITY

Water Pass 24,000 ml of the gas sample through a suitable water-absorption tube no less than 100 mm in length, which previously has been flushed with about 500 ml of the sample and weighed. Regulate the flow so that about 60 min will be required to for passage of the gas. The gain in weight of the absorption tube does not exceed 1.0 mg.

Oxygen, nitrogen,
hydrogen

Determine by Gas chromatography using the following conditions:

Column

- material: stainless steel
- length: 6 m
- internal diameter: 6 mm
- packing material: appropriate molecular sieves, e.g. 5A
- column temperature: 50°

Carrier

- gas: Helium (not less than 99.99 % (v/v))
- flow: 30 ml/min

Detector: thermal conductivity detector

Injector: loop injector

Detector temperature: 130°

Reference gas (a): reference gases hydrogen, oxygen, nitrogen

Gas to be examined (b)

Procedure

Individually inject reference gases (a). Adjust the injected volumes and operating conditions so that the analyzer will be capable of separating and detecting the named components with a sensitivity of 0.1 µl/l or 10% of the specified maximum amount of the component, whichever is greater. Appropriate impurity concentrating techniques may be used to attain the sensitivity. The analyzer is to be calibrated at appropriate intervals by the use of individual calibration gas standards.

Inject the gas to be examined (b). In the chromatogram obtained with the gas to be examined, the total areas of the hydrogen, oxygen and nitrogen should not exceed 1.0% of the total volume of the gas to be examined.

**METHOD OF
ASSAY**

After determination of the total content of water, hydrogen, oxygen and nitrogen the balance consists of argon