

HELIUM

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

SYNONYMS INS No. 939

DEFINITION

Chemical name Helium
C.A.S. number 7440-59-7
Chemical formula He
Formula weight 4.0
Assay Not less than 99.0% by volume

DESCRIPTION Colourless and odourless gas

FUNCTIONAL USES Processing aid

CHARACTERISTICS

IDENTIFICATION

Flame test The flame of a burning splinter of wood is extinguished when inserted into an inverted test tube filled with helium.

GC test See Method of Assay

PURITY

Air Not more than 1.0%, by volume
See Method of Assay

Carbon monoxide Not more than 10 µl/l, by volume
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.

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.

METHOD OF ASSAY Determine by Gas chromatography (see Volume 4) using the following conditions:

Column
- material: stainless steel

- length: 6 m
- internal diameter: 4 mm
- packing material: PoraPak Q, or equivalent

Carrier

- gas: Helium (99.99% (v/v))
- flow 40 ml/min

Detector: thermal conductivity detector

Injector: loop injector

Column temperature: 60°

Detector temperature: 130°

Procedure

Introduce a specimen of helium into a gas chromatograph by means of gas sampling valve. Select the operating conditions of the gas chromatograph so that the standard peak signal resulting from the following procedure corresponds to not less than 70% of the full-scale reading, and which permit complete separation of nitrogen and oxygen from helium, although nitrogen and oxygen may not be separated from each other. The peak response produced by the assay specimen exhibits a retention time corresponding to that produced by an air-helium certified standard (a mixture of 1.0% air in industrial-grade helium is available from most suppliers) and indicates not more than 1.0% air, by volume, when compared with the peak response of the air-helium certified standard, and not less than 99.0% of He, by volume.