



Edition: BP 2025 (Ph. Eur. 11.6 update)

Acetylene Intermix (1 per cent) in Nitrogen



[General Notices](#)

(Ph. Eur. monograph 2903)

Ph Eur

DEFINITION

A mixture containing 1 per cent V/V of acetylene in [Low-oxygen nitrogen \(1685\)](#).

Content

0.95 per cent V/V to 1.05 per cent V/V of acetylene (C₂H₂) in nitrogen (N₂).

This monograph applies to acetylene intermix (1 per cent) in nitrogen used in the preparation of lung function test gas mixtures for medicinal use.

PRODUCTION

The acetylene used in the manufacturing process is produced by hydrolysis of calcium carbide.

Prior to using the gas in the manufacturing process, the acetylene may be passed through an activated charcoal filter.

The acetylene is stored in cylinders, which may be filled with a porous mass with acetone the only solvent permitted.

CHARACTERS

Appearance

Colourless gas.

IDENTIFICATION

A. Examine the chromatograms obtained in the assay.

Results The peak due to acetylene in the chromatogram obtained with the gas to be examined is similar in retention time and size to the peak due to acetylene in the chromatogram obtained with the reference gas.

B. Gas chromatography ([2.2.28](#)).

Gas to be examined The substance to be examined.

Reference gas [Nitrogen R1](#).

Column:

- *material*: stainless steel;
- *size*: $l = 2\text{ m}$, $\varnothing = 2\text{ mm}$;
- *stationary phase*: [molecular sieve for chromatography R](#) (0.5 nm).

Carrier gas [helium for chromatography R](#).

Flow rate 20 mL/min.

Temperature:

- *column*: 80 °C;
- *detector*: 130 °C.

Detection Thermal conductivity.

Injection 10 µL.

Retention time Nitrogen = about 2 min.

Results The principal peak in the chromatogram obtained with the gas to be examined is similar in retention time to the principal peak in the chromatogram obtained with the reference gas.

TESTS

[Acetone](#)

Gas chromatography ([2.2.28](#)).

Gas to be examined The substance to be examined.

Reference gas Mixture containing 250 ppm V/V of [acetone R](#) in [nitrogen R](#).

Column:

- *material*: fused silica;
- *size*: $l = 10\text{ m}$, $\varnothing = 0.53\text{ mm}$;
- *stationary phase*: [polyorganosiloxane for oxygen-containing compounds R](#) (film thickness 10 µm).

Carrier gas [helium for chromatography R](#).

Flow rate 50 mL/min.

Temperature:

- *column*: 200 °C;
- *injection port*: 240 °C;
- *detector*: 250 °C.

Detection Flame ionisation.

Injection 25 µL.

Retention time Acetone = about 1 min.

Calculation of percentage content:

- use the concentration of acetone in the reference gas.

Limit:

- [acetone](#): maximum 250 ppm V/V.

Arsine

Maximum 0.25 ppm V/V, determined using an arsine detector tube ([2.1.6](#)).

Phosphine

Maximum 0.2 ppm V/V, determined using a phosphine detector tube ([2.1.6](#)).

Hydrogen sulfide

Maximum 0.2 ppm V/V, determined using a hydrogen sulfide detector tube ([2.1.6](#)).

Water ([2.5.28](#))

Maximum 10 ppm V/V.

ASSAY

Gas chromatography ([2.2.28](#)).

Gas to be examined The substance to be examined.

Reference gas Mixture containing 1.0 per cent V/V of [acetylene R](#) in [nitrogen R1](#).

Column:

- *material:* stainless steel;
- *size:* $l = 2\text{ m}$, $\varnothing = 2\text{ mm}$;
- *stationary phase:* 3 per cent [squalane R](#) on alumina.

Carrier gas [helium for chromatography R](#).

Flow rate 20 mL/min.

Temperature:

- *column:* 100 °C;
- *detector:* 250 °C.

Detection Flame ionisation.

Injection 100 µL.

Retention time Acetylene = about 6 min.

Calculate the percentage content of C_2H_2 .

STORAGE

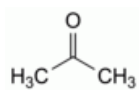
As a compressed gas, in appropriate high-pressure cylinders complying with the legal regulations.

LABELLING

The label states the nominal content, in per cent V/V, of acetylene in nitrogen.

IMPURITIES

Specified impurities A, B, C, D, E.



A. propan-2-one (acetone),



B. arsane (arsine),



C. phosphane (phosphine),



D. hydrogen sulfide,



E. water.

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