



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

Argon

[General Notices](#)

(Ph. Eur. monograph 2407)

Ar 39.95 7440-37-1

Ph Eur



DEFINITION

Gas obtained by fractional distillation of ambient air.

Content

Minimum 99.995 per cent V/V of Ar, calculated by deduction of the sum of impurities found when performing the test for impurities and the water content.

This monograph applies to argon for medicinal use.

CHARACTERS

Appearance

Colourless gas.

Solubility

At 20 °C and at a pressure of 101 kPa, 1 volume dissolves in about 29 volumes of water.

IDENTIFICATION

- A. Verify that the gas is not oxygen using a paramagnetic analyser ([2.5.27](#)).
- B. Gas chromatography ([2.2.28](#)).

Gas to be examined The substance to be examined.

Reference gas (a) Ambient air.

Reference gas (b) [Argon R1](#).

Column:

— *material:* stainless steel;

— *size:* $l = 2$ m, $\varnothing = 2$ mm;

— *stationary phase*: [molecular sieve for chromatography R](#) (0.5 nm).

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

Flow rate 40 mL/min.

Temperature:

— *column*: 50 °C;

— *detector*: at a constant temperature between 50 °C and 200 °C.

Detection Thermal conductivity.

Injection 1 mL loop injector.

System suitability Reference gas (a):

— *resolution*: minimum 1.5 between the peaks due to argon/oxygen and nitrogen.

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 reference gas (b).

TESTS

Impurities

Gas chromatography ([2.2.28](#)).

Gas to be examined The substance to be examined.

Reference gas Use the following mixture of gases in [argon R1](#): [methane R1](#) (5 ppm V/V), [nitrogen R1](#) (5 ppm V/V), [oxygen R](#) (5 ppm V/V).

Column:

— *material*: stainless steel;

— *size*: $l = 4$ m, $\varnothing = 4$ mm;

— *stationary phase*: [molecular sieve for chromatography R](#) (0.5 nm).

Carrier gas [argon R1](#).

Flow rate 70 mL/min.

Temperature:

— *column*: 80 °C;

— *detector*: 40 °C.

Detection Discharge ionisation.

Injection 1 mL.

Sample rate 100 mL/min.

Relative retention With reference to impurity C (retention time = about 4.7 min): impurity A = about 0.4; impurity B = about 0.7.

System suitability Reference gas:

— *resolution*: minimum 3.0 between the peaks due to impurities A and B and minimum 2.0 between the peaks due to impurities B and C.

Limits:

— *impurity A*: not more than the area of the corresponding peak in the chromatogram obtained with the reference gas (5.0 ppm V/V);

— *total*: maximum 0.0040 per cent of the sum of the areas of all the peaks (40.0 ppm V/V).

Water (2.5.28)

Maximum 10.0 ppm V/V, determined using an electrolytic hygrometer.

STORAGE

In gaseous or liquid state, in suitable containers, complying with the legal regulations.

IMPURITIES

Specified impurities A, D.

Other detectable impurities B, C.

- A. O₂: oxygen,
- B. N₂: nitrogen,
- C. CH₄: methane,
- D. H₂O: water.

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