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

# Fenbendazole Granules

General Notices

**Action and use**

Antihelminthic.

## DEFINITION

Fenbendazole Granules contain Fenbendazole mixed with suitable diluents.

*The granules comply with the requirements stated under Granules and with the following requirements.*

**Content of fenbendazole, $C_{15}H_{13}N_3O_2S$**

95.0 to 105.0% of the stated amount.

## IDENTIFICATION

A. In the Assay, the retention time of the principal peak in the chromatogram obtained with solution (1) is the same as that of the principal peak in the chromatogram obtained with solution (2).
B. Carry out the method for thin-layer chromatography, Appendix III A, using the following solutions.
(1) Mix with the aid of ultrasound a quantity of the powdered granules containing 80 mg of Fenbendazole with 80 mL of 0.1M *methanolic hydrochloric acid* for 90 minutes, cool, dilute to 100 mL with 0.1M *methanolic hydrochloric acid*, mix, filter through a 0.4-µm filter (Whatman GF/C is suitable) and use the filtrate.
(2) 0.08% w/v of *fenbendazole BPCRS* in 0.1M *methanolic hydrochloric acid*.

CHROMATOGRAPHIC CONDITIONS

(a) Use a TLC silica gel $F_{254}$ plate (Merck silica gel $F_{254}$ plates are suitable).
(b) Use the mobile phase as described below.
(c) Apply 5 µL of each solution.
(d) Develop the plate to 10 cm.
(e) After removal of the plate, dry in air for 10 minutes, heat at 100° for 5 minutes and examine under *ultraviolet light* (*254 nm* and *365 nm*).

MOBILE PHASE

2.5 volumes of *water*, 6.5 volumes of *acetone*, 26 volumes of *13.5M ammonia* and 65 volumes of *toluene*.

CONFIRMATION

By each method of visualisation the principal spot in the chromatogram obtained with solution (1) corresponds to that in the chromatogram obtained with solution (2).

## TESTS

**Related impurities A, B and 1**

Carry out the method for *liquid chromatography*, Appendix III D, using the following solutions.

(1) Mix, with the aid of ultrasound, a quantity of the powdered granules containing 0.1 g of Fenbendazole with 50 mL of 0.1M *methanolic hydrochloric acid* for 30 minutes, cool, dilute to 100 mL with *methanol (65%)*, mix and filter through a glass-fibre filter (Whatman GF/C is suitable).
(2) Dilute 1 volume of a 0.001% w/v solution of *fenbendazole impurity A EPCRS* (methyl (1*H*-benzimidazol-2-yl)carbamate) in 0.1M *methanolic hydrochloric acid* to 2 volumes with *methanol (65%)*.
(3) Dilute 1 volume of a 0.001% w/v solution of *fenbendazole impurity B EPCRS* (methyl (5-chloro-1*H*-benzimidazol-2-yl)carbamate) in 0.1M *methanolic hydrochloric acid* to 2 volumes with *methanol (65%)*.
(4) Dilute 1 volume of a 0.0010% w/v solution of *fenbendazole impurity 1 BPCRS* (5-phenylthio)-2-aminobenzimidazole) in 0.1M *methanolic hydrochloric acid* to 2 volumes with *methanol (65%)*.
(5) Dilute 1 volume of a solution containing 0.002% w/v each of *fenbendazole impurity A EPCRS*, *fenbendazole impurity B EPCRS*, *fenbendazole impurity 1 BPCRS* and *0.20% w/v of fenbendazole BPCRS* in 0.1M *methanolic hydrochloric acid* to 2 volumes with *methanol (65%)*.

CHROMATOGRAPHIC CONDITIONS

(a) Use a stainless steel column (25 cm × 4.6 mm) packed with *octadecylsilyl silica gel for chromatography* (5 µm) (Nucleosil C18 is suitable).
(b) Use isocratic elution and the mobile phase described below.
(c) Use a flow rate of 1 mL per minute.
(d) Use an ambient column temperature.
(e) Use a detection wavelength of 280 nm.
(f) Inject 20 µL of each solution.

MOBILE PHASE

350 volumes of a 0.5% w/v solution of *sodium dihydrogen orthophosphate* and 650 volumes of *methanol* containing 1.88 g of *sodium hexanesulfonate*, the pH of which has been adjusted to 3.5 with *orthophosphoric acid*.

SYSTEM SUITABILITY

The test is not valid unless the chromatogram obtained with solution (5) closely resembles the reference chromatogram supplied with *fenbendazole BPCRS*.

LIMITS

In the chromatogram obtained with solution (1):

the areas of any peaks corresponding to fenbendazole impurity A, fenbendazole impurity B and fenbendazole impurity 1 (5-(phenylthio)-2-aminobenzimidazole) are not greater than the areas of the corresponding peaks in the chromatograms obtained with solutions (2), (3) and (4) respectively (0.5% each).

## ASSAY

Carry out the method for *liquid chromatography*, Appendix III D, using the following solutions.

(1) Mix with the aid of ultrasound a quantity of the powdered granules containing 0.1 g of Fenbendazole with 50 mL of 0.1M *methanolic hydrochloric acid* for 30 minutes, cool, dilute to 100 mL with *methanol (65%)*, mix, filter through a glass-fibre filter (Whatman GF/C is suitable). Dilute 5 volumes of the resulting solution to 50 volumes with *0.1M hydrochloric acid* in *methanol (85%)*.
(2) 0.01% w/v of *fenbendazole BPCRS* in a mixture of 1 volume of *0.1M hydrochloric acid* and 1 volume of *methanol (85%)*.

CHROMATOGRAPHIC CONDITIONS

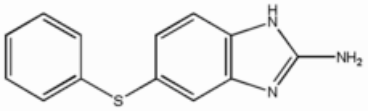
The chromatographic procedure described under Related substances may be used.

DETERMINATION OF CONTENT

Calculate the content of $C_{15}H_{13}N_3O_2S$ in the granules using the declared content of $C_{15}H_{13}N_3O_2S$, in *fenbendazole BPCRS*.

## IMPURITIES

The impurities limited by the requirements of this monograph include impurities A and B listed under Fenbendazole and the following:




1. (5-phenylthio)-2-aminobenzimidazole.