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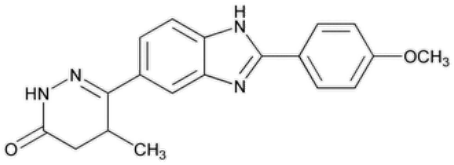
Pimobendan



$C_{19}H_{18}N_4O_2$ 334.37

3(2*H*)-Pyridazinone, 4,5-dihydro-6-[2-(4-methoxyphenyl)-1*H*-benzimidazol-5-yl]-5-methyl-, (±)-;

(±)-4,5-Dihydro-6-[2-(*p*-methoxyphenyl)-5-benzimidazolyl]-5-methyl-3(2*H*)-pyridazinone;

6-[2-(4-Methoxyphenyl)-1*H*-benzimidazol-5-yl]-5-methyl-4,5-dihydropyridazin-3(2*H*)-one CAS RN®: 74150-27-9.

DEFINITION

Pimobendan contains NLT 98.0% and NMT 102.0% of pimobendan ($C_{19}H_{18}N_4O_2$), calculated on the anhydrous basis.

IDENTIFICATION

Change to read:

• **A.** ▲**Spectroscopic Identification Tests ⟨197⟩, *Infrared Spectroscopy*:** 197A, 197K, or 197M.▲ (CN 1-May-2020)

• **B.** The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.

ASSAY

• **Procedure**

Solution A: 3.0 g/L of monobasic potassium phosphate in water. Adjust with suitably diluted phosphoric acid to a pH of 2.5.

Solution B: Acetonitrile

Mobile phase: See *Table 1*.

Table 1

Time (min)	Solution A (%)	Solution B (%)
0	85	15
6	80	20
20	20	80
20.1	85	15
30	85	15

Standard solution: 0.1 mg/mL of USP Pimobendan RS in methanol

Sample solution: 0.1 mg/mL of Pimobendan in methanol

Chromatographic system

(See *Chromatography ⟨621⟩, System Suitability*.)

Mode: LC

Detector: UV 290 nm

Column: 4.6-mm × 12.5-cm; 5-µm packing L1 or 4.0-mm × 12.5-cm; 5-µm packing L1

Column temperature: 45°

Flow rate: 1 mL/min

Injection volume: 10 µL

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: NMT 1.5

Relative standard deviation: NMT 0.73%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of pimobendan ($C_{19}H_{18}N_4O_2$) in the portion of Pimobendan taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times 100$$

r_U = peak response from the *Sample solution*

r_S = peak response from the *Standard solution*

C_S = concentration of USP Pimobendan RS in the *Standard solution* (mg/mL)

C_U = concentration of Pimobendan in the *Sample solution* (mg/mL)

Acceptance criteria: 98.0%–102.0% on the anhydrous basis

IMPURITIES

- **Residue on Ignition ⟨281⟩:** NMT 0.1%
- **Organic Impurities**

Solution A, Solution B, Mobile phase, and **Chromatographic system:** Proceed as directed in the *Assay*.

System suitability solution: 5 µg/mL each of USP Pimobendan Related Compound A RS and USP Pimobendan Related Compound B RS in methanol

Standard solution: 50 µg/mL of USP Pimobendan RS in methanol

Sample solution: 5.0 mg/mL of Pimobendan in methanol

System suitability

Samples: *System suitability solution* and *Standard solution*

Suitability requirements

Resolution: NLT 2.0 between pimobendan related compound A and pimobendan related compound B, *System suitability solution*

Tailing factor: 0.8–1.5, *Standard solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of each impurity in the portion of Pimobendan taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times 100$$

r_U = peak response of each impurity from the *Sample solution*

r_S = peak response of pimobendan from the *Standard solution*

C_S = concentration of USP Pimobendan RS in the *Standard solution* (µg/mL)

C_U = concentration of Pimobendan in the *Sample solution* (µg/mL)

Acceptance criteria: See *Table 2*. Disregard any peak below 0.05%.

Table 2

Name	Relative Retention Time	Acceptance Criteria, NMT (%)
Pimobendan	1.0	—
Pimobendan related compound A	1.3	0.1
Pimobendan related compound B	1.4	0.1
Any other individual impurity	—	0.1
Total impurities	—	0.2

SPECIFIC TESTS

• **Water Determination** ⟨921⟩, *Method I*

Sample: 0.5 g

Acceptance criteria: NMT 1.0%

ADDITIONAL REQUIREMENTS

• **Packaging and Storage:** Preserve in tight containers and store at room temperature.

• **Labeling:** Label it to indicate that it is for veterinary use only.

• **USP Reference Standards** ⟨11⟩

USP Pimobendan RS

USP Pimobendan Related Compound A RS

4-[2-(4-Methoxyphenyl)-1*H*-benzimidazol-5-yl]-3-methyl-4-oxobutanoic acid.

$C_{19}H_{18}N_2O_4$ 338.36

USP Pimobendan Related Compound B RS

N-[2-Amino-4-(4-methyl-6-oxo-1,4,5,6-tetrahydropyridazin-3-yl)phenyl]-4-methoxybenzamide.

$C_{19}H_{20}N_4O_3$ 352.39

Auxiliary Information - Please check for your question in the FAQs before contacting USP.

Topic/Question	Contact	Expert Committee
PIMOBENDAN	Documentary Standards Support	SM32020 Small Molecules 3
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM32020 Small Molecules 3

Chromatographic Database Information: Chromatographic Database

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