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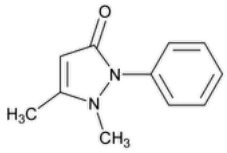
Antipyrine



$C_{11}H_{12}N_2O$ 188.23

1,2-Dihydro-1,5-dimethyl-2-phenyl-3*H*-pyrazol-3-one;

2,3-Dimethyl-1-phenyl-3-pyrazolin-5-one CAS RN®: 60-80-0; UNII: T3CHA1B51H.

DEFINITION

Antipyrine contains NLT 98.0% and NMT 102.0% of antipyrine ($C_{11}H_{12}N_2O$), calculated on the dried basis.

IDENTIFICATION

Change to read:

• **A.** ▲**Spectroscopic Identification Tests ⟨197⟩, *Infrared Spectroscopy*: 197K**▲ (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: 0.77 g/L of ammonium acetate in water. Adjust with diluted ammonium hydroxide to a pH of 7.0 and pass through a filter of 0.2-µm pore size.

Solution B: Acetonitrile

Mobile phase: See *Table 1*.

Table 1

Time (min)	Solution A (%)	Solution B (%)
0	75	25
1.0	75	25
5.0	20	80
5.01	75	25
8.0	75	25

System suitability solution: 0.12 mg/mL of USP Antipyrine RS and 0.12 µg/mL of USP Antipyrine Related Compound A RS in water

Standard solution: 0.12 mg/mL of USP Antipyrine RS in water

Sample solution: 0.12 mg/mL of Antipyrine in water

Chromatographic system

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

Mode: LC

Detector: UV 240 nm

Column: 2.1-mm × 10-cm; 1.8-µm packing L1

Column temperature: 35°

Flow rate: 0.4 mL/min

Injection volume: 1 µL

System suitability

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

Suitability requirements

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

Tailing factor: NMT 2.0, *Standard solution*

Relative standard deviation: NMT 0.73%, *Standard solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of antipyrine ($C_{11}H_{12}N_2O$) in the portion of Antipyrine 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 Antipyrine RS in the *Standard solution* (mg/mL)

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

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

IMPURITIES

- **Residue on Ignition ⟨281⟩:** NMT 0.15%
- **Organic Impurities**

Buffer: Dissolve 6.8 g of monobasic potassium phosphate in 1 L of water, add 2 mL of triethylamine, and adjust with 5 N sodium hydroxide solution to a pH of 7.0.

Mobile phase: Methanol and *Buffer* (43:100)

System suitability solution: 5 µg/mL each of USP Antipyrine RS and USP Antipyrine Related Compound A RS in *Mobile phase*

Standard solution: 0.5 µg/mL of USP Antipyrine RS and 0.25 µg/mL of USP Antipyrine Related Compound A RS in *Mobile phase*

Sample solution: 500 µg/mL of Antipyrine in *Mobile phase*

Chromatographic system

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

Mode: LC

Detector: UV 254 nm

Column: 6.0-mm × 15-cm; 5-µm packing L1

Flow rate: 1 mL/min

Injection volume: 10 µL

Run time: 3 times the retention time of antipyrine

System suitability

Sample: *System suitability solution*

Suitability requirements

Resolution: NLT 3.0 between antipyrine related compound A and antipyrine

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of antipyrine related compound A in the portion of Antipyrine taken:

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

r_U = peak response of antipyrine related compound A from the *Sample solution*

r_S = peak response of antipyrine related compound A from the *Standard solution*

C_S = concentration of USP Antipyrine Related Compound A RS in the *Standard solution* (µg/mL)

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

Calculate the percentage of any individual unspecified impurity in the portion of Antipyrine taken:

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

r_U = peak response of any individual unspecified impurity from the *Sample solution*

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

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

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

Acceptance criteria: See *Table 2*. Disregard any impurity peak less than 0.03%.

Table 2

Name	Relative Retention Time	Acceptance Criteria, NMT (%)
Antipyrine related compound A	0.8	0.05
Antipyrine	1.0	—
Individual unspecified impurity	—	0.05
Total impurities	—	0.1

SPECIFIC TESTS

• **Loss on Drying** ⟨731⟩

Analysis: Dry at 60° for 2 h.

Acceptance criteria: NMT 1.0%

ADDITIONAL REQUIREMENTS

• **Packaging and Storage:** Preserve in tight containers.

• **USP Reference Standards** ⟨11⟩

USP Antipyrine RS

USP Antipyrine Related Compound A RS

3-Methyl-1-phenyl-1*H*-pyrazol-5(4*H*)-one.

$C_{10}H_{10}N_2O$ 174.20

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

Topic/Question	Contact	Expert Committee
ANTIPYRINE	Documentary Standards Support	SM22020 Small Molecules 2
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM22020 Small Molecules 2

Chromatographic Database Information: Chromatographic Database

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