Niridazole (Niridazolum)

**Molecular formula.** \( \text{C}_6\text{H}_6\text{N}_4\text{O}_3\text{S} \)

**Relative molecular mass.** 214.2

**Graphic formula.**

![Graphic formula of Niridazole](image)

**Chemical name.** 1-(5-Nitro-2-thiazolyl)-2-imidazolidinone; CAS Reg. No. 61-57-4.

**Description.** A yellow, crystalline powder; odourless or almost odourless.

**Solubility.** Practically insoluble in water and ether R; soluble in dimethylformamide R and pyridine R; slightly soluble in ethanol (~750 g/l) TS and acetone R.

**Category.** Antischistosomal drug.

**Storage.** Niridazole should be kept in a tightly closed container.

**Requirements**

**Definition.** Niridazole contains not less than 97.0% and not more than 103.0% of \( \text{C}_6\text{H}_6\text{N}_4\text{O}_3\text{S} \), calculated with reference to the dried substance.

**Identity tests**

- Either test A alone or tests B, C and D may be applied.
  
  A. Carry out the examination as described under **1.7 Spectrophotometry in the infrared region**. The infrared absorption spectrum is concordant with the spectrum obtained from niridazole RS or with the **reference spectrum** of niridazole.
  
  B. See the test described below under “Related substances”. The principal spot obtained with solution A corresponds in position, appearance, and intensity with that obtained with solution B.
  
  C. Dissolve 20 mg in 2.0 mL of acetone R, add 2.0 mL of sodium hydroxide (~80 g/l) TS, shake, and allow to stand for 10 minutes; a dark red colour is produced in the lower layer.
  
  D. Melting temperature, about 264°C with decomposition.

**Heavy metals.** Use 1.0 g for the preparation of the test solution as described under **2.2.3 Limit test for heavy metals**. Procedure 3; determine the heavy metals content according to Method A; not more than 20 μg/g.

**Sulfates.** Add 0.5 g of the test substance to a mixture of 2.0 mL of hydrochloric acid (~70 g/l) TS and 8.0 mL of water, heat to boiling, cool to room temperature, filter, and dilute the filtrate to 10 mL with water; the solution is clear. Add 1.0 mL of barium chloride (0.5 mol/l) VS and again heat to boiling.

Similarly prepare a comparison solution containing 0.10 mL of sulfuric acid (0.01 mol/l) VS, 2.0 mL of hydrochloric acid (~70 g/l) TS, 8.0 mL of water, 1.0 mL of barium chloride (0.5 mol/l) VS, and heat to boiling.

Allow both solutions to stand for 1 hour; the opalescence in the solution prepared from the test substance is not more intense than that produced in the comparison solution.

**Solution in dimethylformamide.** A solution of 0.10 g in 10 mL of dimethylformamide R is clear.

**Sulfated ash.** Not more than 3.0 mg/g.

**Loss on drying.** Dry at 100°C under reduced pressure (not exceeding 0.6 kPa or about 5 mm of mercury) for 3 hours; it loses not more than 5.0 mg/g.

**Related substances.** Carry out the test as described under **1.14.1 Thin-layer chromatography**, using silica gel R6 as the coating substance (a precoated plate from a commercial source is suitable) and a mixture of 12 volumes of toluene R and 8 volumes of acetone R as the mobile phase. Apply separately to the plate 5 μl of each of 4 solutions in pyridine R containing (A) 10 mg of the test substance per mL (heat slightly to dissolve, if necessary), (B) 10 mg of niridazole RS per mL (heat slightly to dissolve, if necessary), (C) 10 mg of niridazole RS per mL (heat slightly to dissolve, if necessary), (D) 10 mg of niridazole RS per mL (heat slightly to dissolve, if necessary).
necessary), (C) 20 μg of 2-amino-5-nitrothiazole RS per mL, and (D) 40 μg of niridazole-chlorethylcarboxamide RS per mL. After removing the plate from the chromatographic chamber, allow it to dry in a current of air; examine the chromatogram immediately in ultraviolet light (365 nm) and again after 15 minutes' irradiation. Any spot obtained with solution A, other than the principal spot, is not more intense than that obtained with solution C viewed immediately and not more intense than that obtained with solution D viewed after 15 minutes.

Assay. Dissolve about 40 mg, accurately weighed, in 4 mL of dimethylformamide R and dilute with sufficient dehydrated ethanol R to produce 200 mL; dilute 5.0 mL of this solution to 100 mL with the same solvent. Measure the absorbance of a 1-cm layer of the diluted solution at the maximum at about 359 nm. Calculate the amount of $\text{C}_6\text{H}_6\text{N}_4\text{O}_3\text{S}$ in the substance being tested by comparison with niridazole RS, similarly and concurrently examined. In an adequately calibrated spectrophotometer the absorbance of a 10 μg/mL solution of niridazole RS should be 0.70 ± 0.03.