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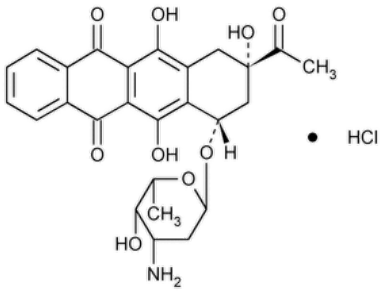
Idarubicin Hydrochloride



$C_{26}H_{27}NO_9 \cdot HCl$ 533.95

5,12-Naphthacenedione, 9-acetyl-7-[(3-amino-2,3,6-trideoxy-α-L-*lyxo*-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,9,11-trihydroxyhydrochloride, (7*S*-*cis*)-.

(1*S*,3*S*)-3-Acetyl-1,2,3,4,6,11-hexahydro-3,5,12-trihydroxy-6,11-dioxo-1-naphthacenyl 3-amino-2,3,6-trideoxy-α-L-*lyxo*-hexopyranoside, hydrochloride CAS RN®: 57852-57-0; UNII: 5VV3MDU5IE.

» Idarubicin Hydrochloride contains not less than 960 µg and not more than 1030 µg of $C_{26}H_{27}NO_9 \cdot HCl$ per mg, calculated on the anhydrous basis.

[**Caution—**Great care should be taken to prevent inhaling particles of Idarubicin Hydrochloride and exposing the skin to it.]

Packaging and storage—Preserve in tight containers.

Labeling—The amorphous form is so labeled.

USP Reference Standards ⟨11⟩—

USP Idarubicin Hydrochloride RS

Identification—

Change to read:

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

B: The chromatogram of the *Assay preparation* obtained in the *Assay* exhibits a major peak for idarubicin, the retention time of which corresponds to that in the chromatogram of the *Standard preparation* obtained in the *Assay*.

Crystallinity ⟨695⟩: meets the requirements, except where it is labeled as amorphous, most of the particles do not exhibit birefringence and extinction positions.

pH ⟨791⟩: between 5.0 and 6.5, in a solution containing 5 mg per mL.

Water Determination, *Method I* ⟨921⟩: not more than 5.0%.

Chromatographic purity—Using the chromatogram of the *Assay preparation* obtained in the *Assay*, and disregarding the solvent peak, calculate the percentage of each impurity taken by the formula:

$$100 r_i / r_S$$

in which r_i is the response of each impurity peak; and r_S is the sum of the responses of all the peaks: not more than 1.0% of any individual impurity is found; and the sum of all impurities is not more than 3.0%.

Assay—

Mobile phase—Prepare a mixture of water, acetonitrile, methanol, and phosphoric acid (540:290:170:2). Dissolve 1 g of sodium lauryl sulfate in 1000 mL of this solution, adjust with 2 N sodium hydroxide to a pH of 3.6 ± 0.1, pass through a filter having a porosity of 0.5 µm or finer, and degas. Make adjustments if necessary (see *System Suitability* under *Chromatography* ⟨621⟩).

Diluent—Prepare as directed for *Mobile phase*, except to omit the sodium lauryl sulfate.

Standard preparation—Dissolve an accurately weighed quantity of USP Idarubicin Hydrochloride RS in *Diluent* to obtain a solution having a known concentration of about 500 µg of idarubicin hydrochloride per mL.

Assay preparation—Transfer about 50 mg of Idarubicin Hydrochloride, accurately weighed, to a 100-mL volumetric flask, dissolve in *Diluent*, dilute with *Diluent* to volume, and mix.

Resolution solution—Prepare an aqueous solution containing 1 mg of Idarubicin Hydrochloride per mL. To 2 mL of this solution in a test tube, add 20 µL of hydrochloric acid, and heat in an oil bath at 95° for about 8 minutes. Mix 1 mL of this solution and 9 mL of *Diluent*. This

Resolution solution contains a mixture of 4-demethoxydaunorubicinone and idarubicin.

Chromatographic system (see *Chromatography* ⟨621⟩)—The liquid chromatograph is equipped with a 254-nm detector and a 4.6-mm × 25-cm column that contains packing L13. The flow rate is about 2 mL per minute. Chromatograph the *Resolution solution*, and record the peak responses as directed for *Procedure:* the relative retention times are about 0.5 for 4-demethoxydaunorubicinone and 1.0 for idarubicin; and the resolution, *R*, between the 4-demethoxydaunorubicinone peak and the idarubicin peak is not less than 9.5. Chromatograph the *Standard preparation*, and record the peak responses as directed for *Procedure:* the capacity factor, *k'*, for the idarubicin peak is not less than 10 and not more than 20; the tailing factor for the idarubicin peak is not less than 0.85 and not more than 1.2; the column efficiency calculated from the idarubicin peak is not less than 3000 theoretical plates; and the relative standard deviation for replicate injections is not more than 2.0%.

Procedure—Separately inject equal volumes (about 20 µL) of the *Standard preparation* and the *Assay preparation* into the chromatograph, record the chromatograms, and measure the areas for the major peaks. Calculate the quantity, in µg, of $C_{26}H_{27}NO_9 \cdot HCl$ in each mg of the Idarubicin Hydrochloride taken by the formula:

$$100(C/M)(r_U/r_S)$$

in which *C* is the concentration, in µg per mL, of idarubicin hydrochloride ($C_{26}H_{27}NO_9 \cdot HCl$) in the *Standard preparation; M* is the quantity, in mg, of Idarubicin Hydrochloride taken to prepare the *Assay preparation;* and r_U and r_S are the responses of the idarubicin peak obtained from the *Assay preparation* and the *Standard preparation*, respectively.

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

Topic/Question	Contact	Expert Committee
IDARUBICIN HYDROCHLORIDE	Documentary Standards Support	SM12020 Small Molecules 1

Chromatographic Database Information: Chromatographic Database

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