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Enantioselective analysis for L-pidolic acid in ertugliflozin drug substance and drug product by chiral gas chromatography with derivatization

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Abstract

L-pidolic acid is being used as a coformer for ertugliflozin, a sodium-glucose cotransport 2 inhibitor. A sensitive and rapid two-step achiral derivatization combined with gas chromatography with flame ionization detection or gas chromatography with mass spectroscopic detection was developed and validated for the enantiomeric purity determination of L-pidolic acid in the drug substance and drug product, respectively. The method was used to analyze ertugliflozin drug substance forced degradation samples and showed no racemization of pidolic acid in any of the solid or solution stress samples. Analysis of ertugliflozin drug product stability samples showed no significant levels of D-pidolic acid in the drug product indicating that no significant racemization of pidolic acid occurs in the drug product under normal storage conditions. Based on the data generated, a chiral control for pidolic acid is not necessary for drug substance or drug product, but rather can be controlled in the purchase of L-pidolic acid.

Highlights

- Enantiomeric purity method for L-pidolic acid in a drug substance and drug product validated.
- Purge of D-pidolic acid observed in the drug substance.
- No racemization of pidolic acid observed in the drug substance or drug product.
- No chiral testing for pidolic acid is needed for the drug substance or drug product.

Keywords

Pidolic acid, enantiomeric purity, enantioselective gas chromatography, validation, derivatization, drug substance, drug product

1. Introduction