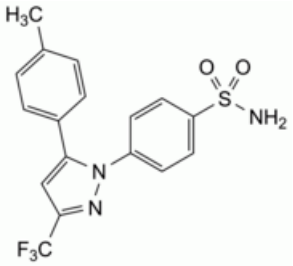
Edition: BP 2025 (Ph. Eur. 11.6 update)

Celecoxib

General Notices

(Ph. Eur. monograph 2591)



$C_{17}H_{14}F_3N_3O_2S$ 381.4 *169590-42-5*

Action and use

Cyclo-oxygenase (COX-2) inhibitor; analgesic; anti-inflammatory.

Preparation

Celecoxib Capsules

Ph Eur

DEFINITION

4-[5-(4-Methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl]benzenesulfonamide.

Content

98.0 per cent to 102.0 per cent (anhydrous substance).

CHARACTERS

Appearance

White or almost white, crystalline or amorphous powder.

Solubility

Practically insoluble in water, freely soluble to soluble in anhydrous ethanol, soluble in methylene chloride.

It shows polymorphism (*5.9*).

IDENTIFICATION

Infrared absorption spectrophotometry (2.2.24).

Comparison celecoxib CRS.

If the spectra obtained show differences, dissolve the substance to be examined and the reference substance separately in 2-propanol R, evaporate to dryness and record new spectra using the residues.

TESTS

Related substances

Liquid chromatography (2.2.29).

Solvent mixture water R, methanol R2 (25:75 *V/V*).

Test solution Dissolve 50.0 mg of the substance to be examined in the solvent mixture and dilute to 100.0 mL with the solvent mixture.

Reference solution (a) Dissolve 50.0 mg of celecoxib CRS in the solvent mixture and dilute to 100.0 mL with the solvent mixture.

Reference solution (b) Dissolve 3 mg of celecoxib impurity A CRS and 3 mg of celecoxib impurity B CRS in the solvent mixture and dilute to 50.0 mL with the solvent mixture. Dilute 1.0 mL of the solution to 25.0 mL with reference solution (a).

Reference solution (c) Dilute 1.0 mL of the test solution to 100.0 mL with the solvent mixture. Dilute 1.0 mL of this solution to 10.0 mL with the solvent mixture.

Column:

— *size*: *l* = 0.25 m, Ø = 4.6 mm;

— *stationary phase*: end-capped phenylsilyl silica gel for chromatography R (5 µm);

— *temperature*: 60 °C.

Mobile phase Mix 10 volumes of acetonitrile R1, 30 volumes of methanol R2 and 60 volumes of a 2.7 g/L solution of potassium dihydrogen phosphate R previously adjusted to pH 3.0 with phosphoric acid R.

Flow rate 1.5 mL/min.

Detection Spectrophotometer at 215 nm.

Injection 25 µL of the test solution and reference solutions (b) and (c).

Run time 1.5 times the retention time of celecoxib.

Identification of impurities Use the chromatogram obtained with reference solution (b) to identify the peaks due to impurities A and B.

Relative retention With reference to celecoxib (retention time = about 27 min): impurity A = about 0.9; impurity B = about 1.1.

System suitability:

— resolution: minimum 1.5 between the peaks due to impurity A and celecoxib and minimum 1.8 between the peaks due to celecoxib and impurity B in the chromatogram obtained with reference solution (b).

Calculation of percentage contents:

— for all impurities, use the concentration of celecoxib in reference solution (c).

Limits:

— *impurity A*: maximum 0.4 per cent;

— *unspecified impurities*: for each impurity, maximum 0.10 per cent;

— *total*: maximum 0.5 per cent;

— *reporting threshold*: 0.05 per cent.

Water (*2.5.12*)

Maximum 0.5 per cent, determined on 0.400 g.

Sulfated ash (*2.4.14*)

Maximum 0.2 per cent, determined on 1.0 g in a platinum crucible.

ASSAY

Liquid chromatography (*2.2.29*) as described in the test for related substances with the following modification.

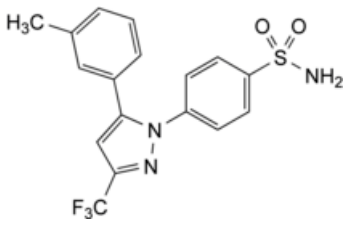
Injection Test solution and reference solution (a).

Calculate the percentage content of $C_{17}H_{14}F_3N_3O_2S$ taking into account the assigned content of *celecoxib CRS*.

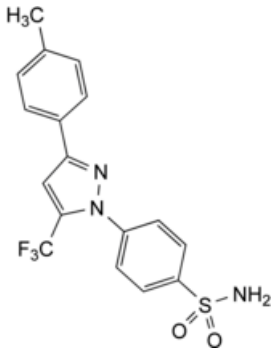
IMPURITIES

Specified impurities *A*.

Other detectable impurities (the following substances would, if present at a sufficient level, be detected by one or other of the tests in the monograph. They are limited by the general acceptance criterion for other/unspecified impurities and/or by the general monograph Substances for pharmaceutical use (2034). It is therefore not necessary to identify these impurities for demonstration of compliance. See also 5.10. Control of impurities in substances for pharmaceutical use) *B*.



A. 4-[5-(3-methylphenyl)-3-(trifluoromethyl)-1*H*-pyrazol-1-yl]benzenesulfonamide,



B. 4-[3-(4-methylphenyl)-5-(trifluoromethyl)-1*H*-pyrazol-1-yl]benzenesulfonamide.