probe (Protasis) using tetramethylsilane as an internal reference when tetramethylsilane was contained in a deuterated solvent or using an NMR solvent as an internal reference in other cases, and all δ values were expressed in ppm.

[0036]

Abbreviations have the following meanings.

s: Singlet

d: Doublet

dd: Double doublet

m: Multiplet

brs: Broad singlet

[0037]

Powder X-ray diffraction measurement

Powder X-ray diffraction was measured under the following test conditions after a suitable amount of test substance was lightly milled with an agate mortar as necessary.

Apparatus: Rigaku MiniFlex II

Target: Cu

X-ray output setting: 15 mA, 30 kV

Scan range: 2.0 to 40.0°

Step size: 0.010°

Scan speed: 5.00°/min.

Divergence slit: 1.25°

Scattering slit: Open

Receiving slit: Open

The apparatuses, including the apparatus for data processing, were handled according to the processes and procedures instructed for the apparatuses.

Numerical values obtained from various spectra may slightly vary depending on, for example, the direction of crystal growth,

differential scanning calorimetry (DSC) curve of Figure 2, the endothermic peak was 81.3°C.

^{1}H-NMR ($CDCl_3$): δ ppm 1.53 (3H, d, J = 6.8 Hz), 1.56-1.98 (10H, m), 2.67-2.78 (1H, m), 2.80-2.91 (1H, m), 3.42-3.60 (2H, m), 4.51-4.63 (1H, m), 4.74-4.89 (2H, m), 5.05 (2H, s), 5.76 (1H, dd, J = 7.8 Hz, 2.2 Hz), 6.77-6.89 (3H, m), 7.20-7.27 (2H, m), 8.76 (1H, brs): LRMS (ESI) m/z 452 [M+H]

[0040]

Example 2: Synthesis of (R)-N-(1-(3-(cyclopentyloxy)phenyl)ethyl)-3-((2,4-dioxo-3,4-dihydropyrimidin-1(2H)-yl)methoxy)propane-1-sulfonamide (crystal II)

Butyl acetate (5 mL) was added to a crude product (500 mg) of compound (1), which had been synthesized by the known procedure disclosed in Patent Document 1, and thereafter the compound was completely dissolved using an oil bath set at 70°C and then allowed to be cooled in air. White solids were precipitated at an inner temperature of 45°C, collected by filtration, and dried by being heated under reduced pressure for 20 hours, and crystal II of compound (1) was thus obtained as white powder (Yield: 412.5 mg, 82.5%). As shown in the powder X-ray diffraction spectrum of Figure 3, principal 2θ peaks were 7.3°, 11.8°, 14.5°, 14.8°, 16.8°, 17.5°, 18.6°, 19.5°, 20.4°, 23.9°, 24.4°, 25.7°, 26.8°, and 31.5°. As shown in the differential scanning calorimetry (DSC) curve of Figure 4, the endothermic peak was 108.0°C.

^{1}H-NMR ($CDCl_3$): δ ppm 1.53 (3H, d, J = 6.8 Hz), 1.56-1.98 (10H, m), 2.67-2.78 (1H, m), 2.80-2.91 (1H, m), 3.42-3.60 (2H, m), 4.51-4.63 (1H, m), 4.74-4.89 (2H, m), 5.05 (2H, s), 5.76 (1H, dd, J = 7.8 Hz, 2.2 Hz), 6.77-6.89 (3H, m), 7.20-7.27 (2H, m), 8.76 (1H, brs): LRMS (ESI) m/z 452 [M+H]

[0041]

trapezoidal method using Phoenix WinNonlin (v6.3.0), software manufactured by Pharsight.

[0045]

Results are shown in Table 1. From this test, it was found that crystal II shows an $AUC_{0\text{-}24hr}$ (the area under blood concentration-time curve 0 to 24 hours after administration) value similar to that of crystal I. It was thus verified that crystal II according to the present invention, which has preferable oral absorbability and can be obtained in a highly reproducible manner, can be secured.

[0046]

[Table 1]

Parameter	Oral administration	
	Crystal I	Crystal II
$AUC_{0\text{-}24hr}$ (μM·hr)	122.16	144.51

[0047]

Test Example 2: Solid stability test (under light exposure)

The solid stabilities of crystal I and crystal II obtained in the Examples, when stored for 1 month under light exposure, were measured under the following conditions.

[0048]

Storage condition: Sample was placed in a transparent glass bottle, then the lid was placed, and the grove between the lid and the bottle was sealed by the grafting tape.

Measurement point: 1 Month

Stored amount: About 30 mg

Storage container: Clear glass bottle

[0049]

Chemical purity of compound (1) in the sample solution was measured by HPLC analysis. The apparatuses, including the apparatus for data processing, were handled according to the processes and procedures instructed for the apparatuses. (Apparatus: Shimadzu Corporation LC-20AB)

Column: L-column 2 ODS manufactured by Chemicals Evaluation and Research Institute, 4.6 x 150 mm, 5 μm

UV detection: 220 nm

Column temperature: 50°C

Column flow rate: 1.0 mL/min

Mobile phase: A; Water, B; Acetonitrile

Injection amount: 10 μL

Sample concentration: 1.0 mg/mL

Gradient: Table 2

[0050]

[Table 2]

Time(min)	A	B
0 - 10	65% → 60%	35% → 40%
10 - 30	60% → 10%	40% → 90%

[0051]

The chemical purity results of compound (1) measured are shown in Table 3. The chemical purities of crystal I and crystal II did not change for 1 month under light exposure, and also the results of powder X-ray crystallography revealed no change of crystal form (Figure 5 and Figure 6).

[0052]