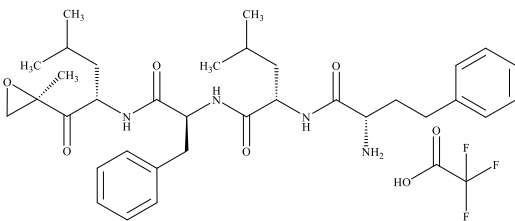


Certificate of Analysis

Certificate No.: 20200630026

Date: June 30, 2020

Retest date: June 19, 2023

Compound Name:	Carfilzomib Impurity 5 TFA Salt	
Synonyms:	(S)-2-((S)-2-amino-4-phenylbutanamido)-4-methyl-N-((S)-1-(((S)-4-methyl-1-((R)-2-methyloxiran-2-yl)-1-oxopentan-2-yl)amino)-1-oxo-3-phenylpropan-2-yl)pentanamide, 2,2,2-trifluoroacetate (1:1)	
TLC Catalogue Number:	C-121008	
CAS Number:	1545469-02-0	
Molecular Weight:	592.78 114.02	
Molecular Formula:	C ₃₄ H ₄₈ N ₄ O ₅ . C ₂ HF ₃ O ₂	
Source:	TLC Pharmaceutical Standards	
Source Lot No.:	3886-047A4	
Storage Conditions:	Store at 2-8 °C	
Solubility:	Methanol, DMSO	

Test Description	Specifications	Results
Visual Description	White to off-white solid	Conforms
Identification		
IR	Conforms to structure	Conforms
MS	Conforms to structure	Conforms
¹H NMR	Conforms to structure	Conforms
Elemental Analysis	Conforms to structure	Conforms
Purity (HPLC)	Not less than 90.0%	95.1%
Impurity (HPLC)	RT 4.30, 0.33%; RT 5.27, 3.07%; RT 9.17, 0.36%	
Water Content (KF)	N/A	1.3%
Optical Rotation	N/A	[α] _D ^{25.0} (c=0.44, CH ₃ OH): +21.1°
Residual Solvents (NMR)	0.2% acetonitrile	
Assay (%)	Not less than 85.0%	93.7%
Recommendation:	Released. The compound contains 3.1% Carfilzomib Impurity 71 (RT 5.27, TLC No. C-121074) according to HPLC and LC-MS.	

Name	Department	Signature	Date
Reviewed and approved by:	Analytical Services		
Approved by:	Quality Assurance		

Attachments: HPLC, IR, MS and NMR spectra.