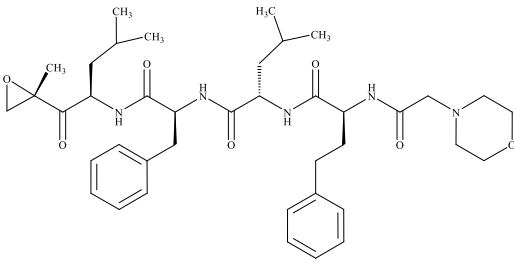


# Certificate of Analysis

Certificate No.: 20200703023

Date: July 3, 2020

Retest date: June 30, 2023

<b>Compound Name:</b>	<b>Carfilzomib Impurity 12</b>	
<b>Synonyms:</b>	(S)-4-methyl-N-((S)-1-(((R)-4-methyl-1-((S)-2-methyloxiran-2-yl)-1-oxopentan-2-yl)amino)-1-oxo-3-phenylpropan-2-yl)-2-((S)-2-(2-morpholinoacetamido)-4-phenylbutanamido)pentanamide	
<b>TLC Catalogue Number:</b>	C-121015	
<b>CAS Number:</b>	2049025-67-2	
<b>Molecular Weight:</b>	719.92	
<b>Molecular Formula:</b>	C <sub>40</sub> H <sub>57</sub> N <sub>5</sub> O <sub>7</sub>	
<b>Source:</b>	TLC Pharmaceutical Standards	
<b>Source Lot No.:</b>	3933-075A5	
<b>Storage Conditions:</b>	Store at 2-8 °C	
<b>Solubility:</b>	DMSO, DMF, Methanol	

Test Description	Specifications	Results
<b>Visual Description</b>	White to off-white solid	<b>Conforms</b>
<b>Identification</b>		
<b>IR</b>	Conforms to structure	<b>Conforms</b>
<b>MS</b>	Conforms to structure	<b>Conforms</b>
<b><sup>1</sup>H NMR</b>	Conforms to structure	<b>Conforms</b>
<b>Purity (HPLC)</b>	Not less than 95.0%	<b>98.2%</b>
<b>Impurity (HPLC)</b>	RT 8.33, 0.64%; RT 10.56, 0.56%; RT 19.28, 0.27%	
<b>Water Content (KF)</b>	N/A	<b>0.4%</b>
<b>Optical Rotation</b>	N/A	$[\alpha]_D^{25.0}(c=0.32, \text{CHCl}_3)$ : <b>-91.3°</b>
<b>Residual Solvents (NMR)</b>	No residual solvent	
<b>Assay (%)</b>	Not less than 90.0%	<b>97.8%</b>
<b>Recommendation:</b>	<b>Released.</b> The compound contains 0.6% Carfilzomib (RT 8.33, TLC No. C-121001) according to HPLC.	

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

**Attachments:** HPLC, IR, MS and NMR spectra.