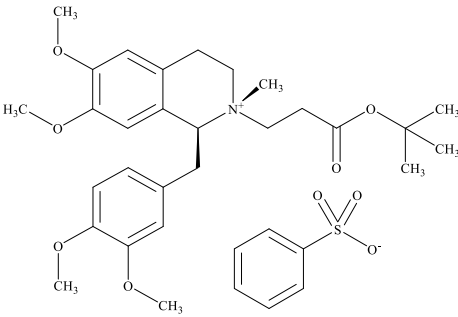


Certificate of Analysis

Certificate No.: 20200701009

Date: July 1, 2020

Retest date: June 12, 2023

Compound Name:	Atracurium Impurity 31 Besylate	
Synonyms:	(1S,2R)-2-(3-(<i>tert</i> -butoxy)-3-oxopropyl)-1-(3,4-dimethoxybenzyl)-6,7-dimethoxy-2-methyl-1,2,3,4-tetrahydroisoquinolin-2-ium, benzenesulfonate (1:1)	
TLC Catalogue Number:	A-7568	
CAS Number:	N/A	
Molecular Weight:	486.63 157.16	
Molecular Formula:	C ₂₈ H ₄₀ NO ₆ · C ₆ H ₅ O ₃ S	
Source:	TLC Pharmaceutical Standards	
Source Lot No.:	3859-058A10	
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
Purity (HPLC)	Not less than 95.0%	99.5%
Impurity (HPLC)	RT 2.41, 0.21%; RT 3.01, 0.19%	
Purity (Chiral HPLC)	Not less than 98.0%	100.0%
Water Content (KF)	N/A	0.5%
Optical Rotation	N/A	[α] _D ^{25.0} (c=0.43, DMSO): +94.6°
Residual Solvents (NMR)	No residual solvent	
Assay (%)	Not less than 90.0%	99.0%
Recommendation:	Released.	

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

Attachments: HPLC, IR, MS and NMR spectra.