

**CERTIFICATE OF ANALYSIS**

<b>Lot Number:</b>	<b>1939L015</b>	<b>Name: Nicotine</b>	<b>Quality: USP/Ph.Eur.</b>
<b>Date of Mfg:</b>	<b>10/1/2019</b>	<b>CAS# : 54-11-5</b>	<b>UN# : 1654</b>
<b>Date of Retest:</b>	<b>10/1/2023</b>	<b>Formula: C10H14N2</b>	<b>Molecular wgt: 162.2</b>
<b>Nicotine Purity:</b>	<b>99.70%</b>		

<b>Test</b>	<b>Test Method</b>	<b>Specificatin</b>	<b>Result</b>
Description	BE-183785	colourless to yellow or brownish liquid	Conforms
IR-Spectrum	IR-183785	in accordance with the standard spectrum	Conforms
Clarity of solution	KLB-183785	NMT 3 FTU; clear ( 10 % mN in water)	0.7 FTU
Colour of solution	FAB-183785	NLT 5 on scale BY, Y or R (10 % mN in water	7
Specific rotation	SBD-183785	-143 - -130 • at 25°C in ethanol 96 % (calculated on the anhydrous basis)	-133
Specific rotation	SCD-183785	-152 - -140 • in ethanol abs. (calculated on the -anhydrous basis)	-144
Arsenic	GPAS -183785	NMT2ppm	<1 ppm
Cadmium	PLCD-183785	NMT0.5 ppm	<0.20 ppm
Heavy metals (Pb)	SM-183785	NMT20ppm	<10 ppm
Water (KF)	KF-183785	NMT0.5%	0.02%
Assay (Non-aqu . titr .)	TIG-183785	99.0 - 101.0 % (calculated on the anhydrous basis)	99.70%
Identity (HPLC)	LCV-183785	the retention time of the major peak corresponds to that of the reference	Conforms
Related substances (HPLC)	LCV-183785	NMT 0.15 % cotinine	<0.06%
Related substances (HPLC)	LCV-183785	NMT0.15 % myosmine	<0.06%
Related substances (HPLC)	LCV-183785	NMT 0.15 % nicotine N-oxide	<0.06%
Related substances (HPLC)	LCV-183785	NMT 0.15 % nornicotine	<0.06%
Related substances (HPLC)	LCV-183785	NMT 0.15 % anatabine	<0.06%
Related substances (HPLC)	LCV-183785	NMT 0.10 % ̢-nicotyrine	<0.06%
Related substances (HPLC)	LCV-183785	NMT 0.10 % anabasine	<0.06%
Related substances (HPLC)	LCV-183785	NMT 0.10 % greatest unknown impurity (no unkwown impurity greater than 0.10%)	<0.06%
Related substances (HPLC)	LCV-183785	NMT 0.8 % sum of impurities	<0.06%
Residual solvent	GCH-183785	500 ppm cyclohexane	15 ppm

Storage Conditions: Store under nitrogen in airtight containers with temperatures at or below 20° C or 68° F protected from light and moisture.

Transportation: Transport at temperatures at or below 30° C or 86° F.

Certificate of Analysis Prepared For:



**Vermillion River LLC**  
**830 Industrial Park Dr Se**  
**Lonsdale MN 55044**  
**651-705-2400**  
**Sales@VermillionRiverSupply.com**