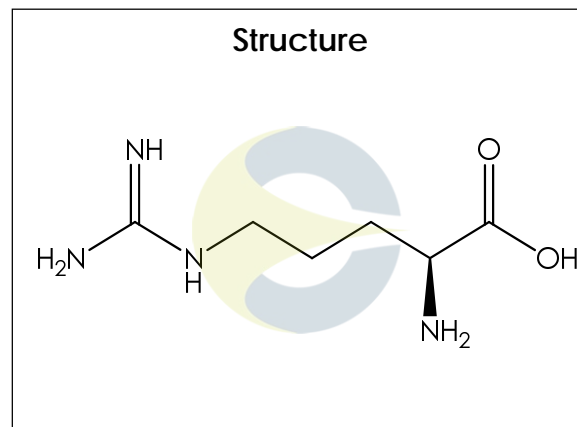


CERTIFICATE OF ANALYSIS
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PRODUCT NAME	L-Arginine
PART NUMBER	00001981
STANDARD TYPE	Primary (P)
LOT NUMBER	00001981-263
REPORT NUMBER	CDXA-RSS-7633-00
SAMPLE NUMBER	CDXA-17-009520
DATE OF SAMPLE	08/01/2017
DATE OF REPORT	08/21/2017



CHEMICAL NAMES	(S)-2-Amino-5-((aminoiminomethyl)amino)pentanoic acid; 5-((Aminoiminomethyl)amino)-l-norvaline; N ⁵ -(Aminoiminomethyl)-L-ornithine
CHEMICAL FORMULA	C ₆ H ₁₄ N ₄ O ₂
MOLECULAR WEIGHT (MW)	174.20
CHEMICAL FAMILY	Amino acids
CAS NUMBER	[74-79-3]
EC#(EINECS)	200-811-1
RTECS	CF1934200

ANALYTICAL RESULTS

TEST	METHOD	SPECIFICATION	RESULT
Adjusted Purity	NA	NA	99.6%
HPLC	CDXA-AM-101-00	NA	99.9%
NMR	4.5.3-CD-4.0-000338	Conforms to structure	Conforms to structure
Mass Spectrum	99.1-CDXA-2.0-000126	Conforms	Conforms
Residual Solvent	99.1-CD-9.0-000115	NA	ND
Water	99.1-34-8.0-000094	NA	0.3%
Appearance	NA	NA	White powder

ADJUSTED PURITY: 99.6% IS BASED ON (100 - 0.3 WATER - 0.0 SOLVENTS) X 99.9% HPLC

STORAGE CONDITIONS

STORAGE	Room Temperature in a dry place.
EXPIRATION DATE	08/2022 under the above conditions.

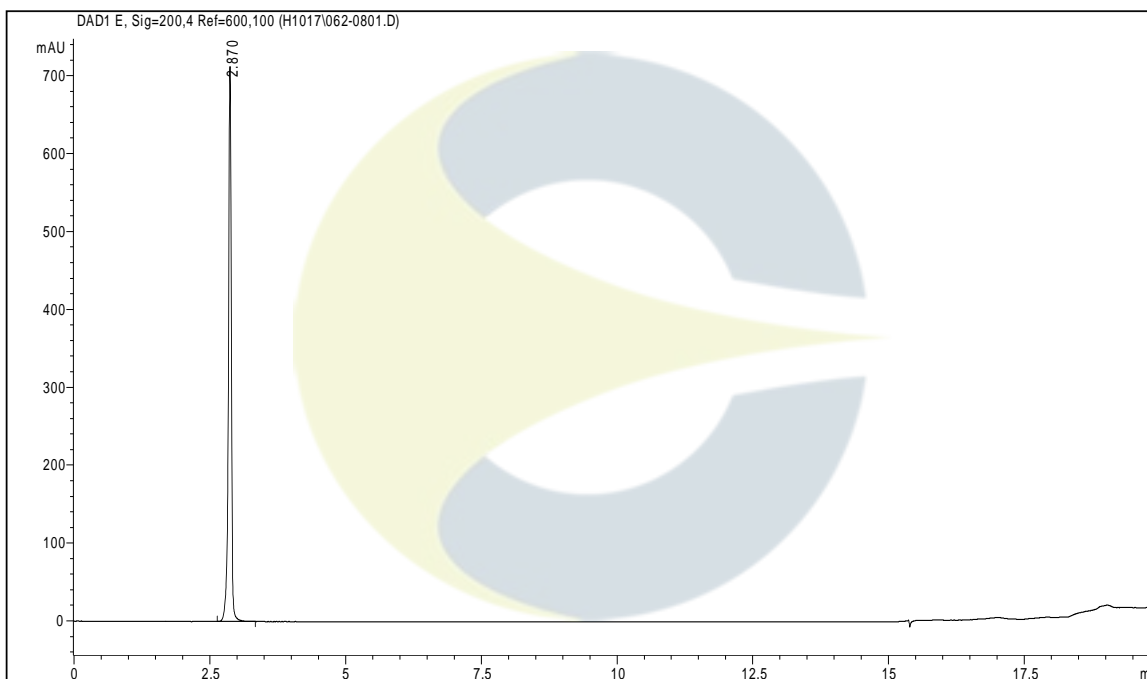
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ANALYTICAL CONDITIONS

INSTRUMENT	AGILENT 1100 HPLC UV-VIS (DAD) DETECTOR, AGILENT 6510 QTOF
COLUMN	Phenomenex Synergi Hydro-RP, 250 x 4.6mm, 4 µm particle size
MOBILE PHASE	A - 10 mM Potassium phosphate in Milli-Q water, pH 2.9, B - Acetonitrile; Isocratic 0% B for 10 minutes, then increasing to 40% B over 5 minutes. Hold at 40% B for 5 minutes.
COLUMN TEMP.	22 °C
FLOW RATE	1.0 mL/minute
INJECTION VOL.	1.5 µL
INJECTION CONC.	1.2 mg/mL in Milli-Q water
DETECTION	200 ± 2 nm

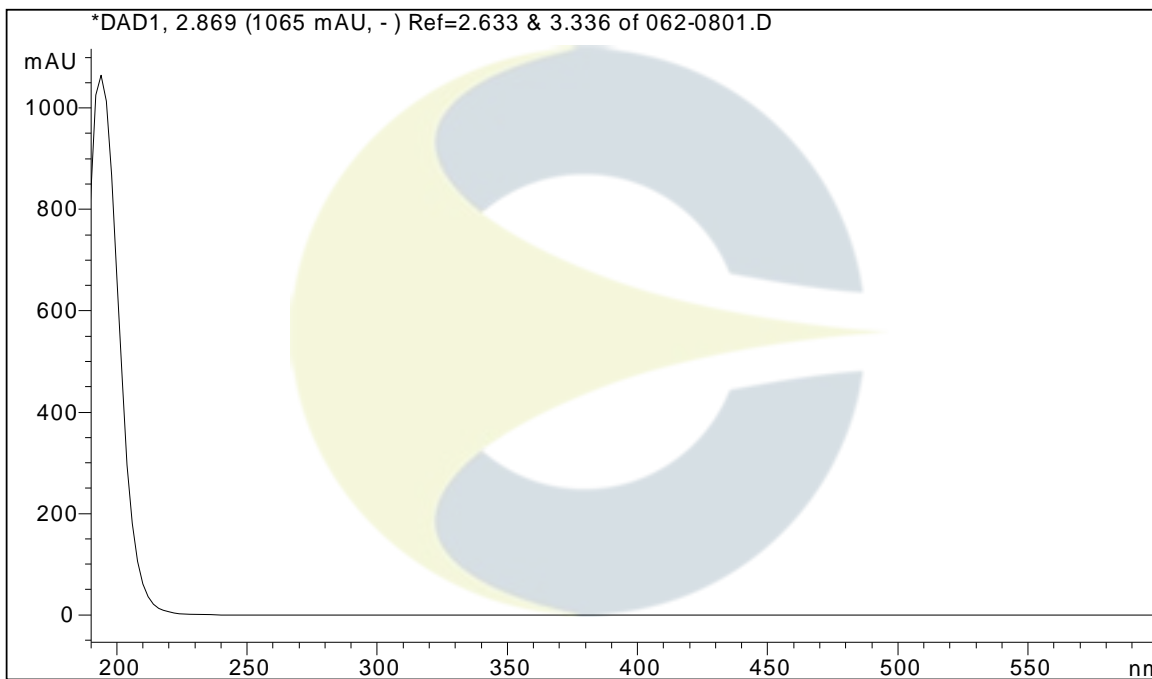
HPLC CHROMATOGRAM OF L-ARGININE (CDXA-17-009520)



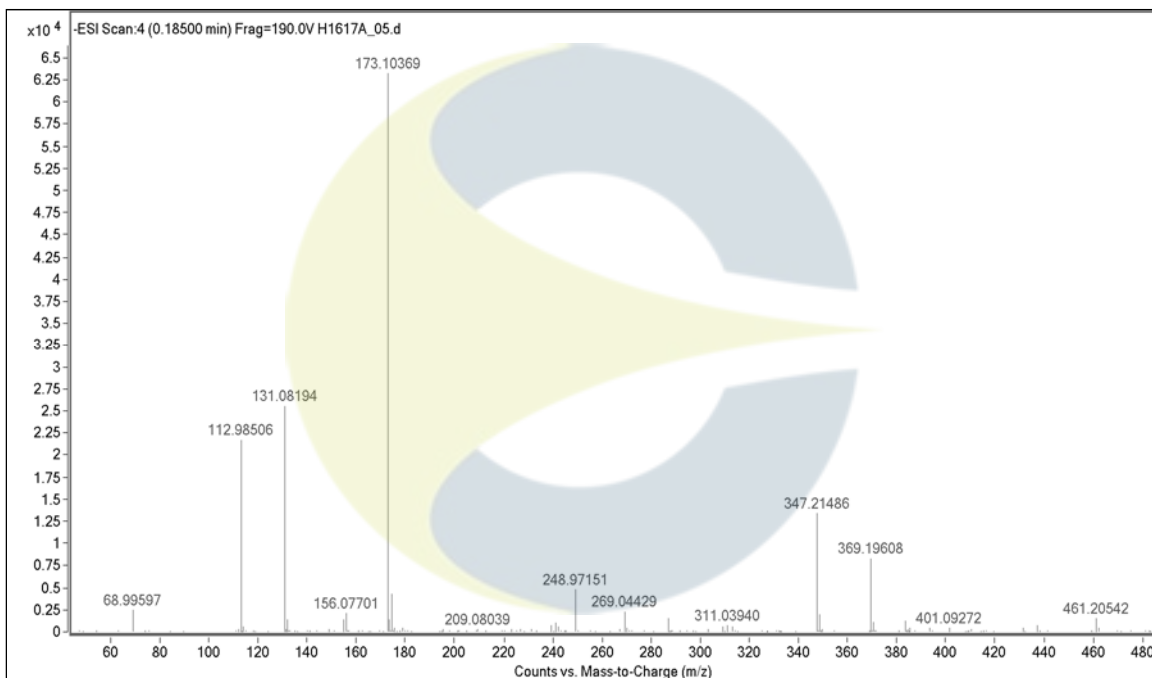
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UV SPECTRUM AT RT = 2.9 MINUTES



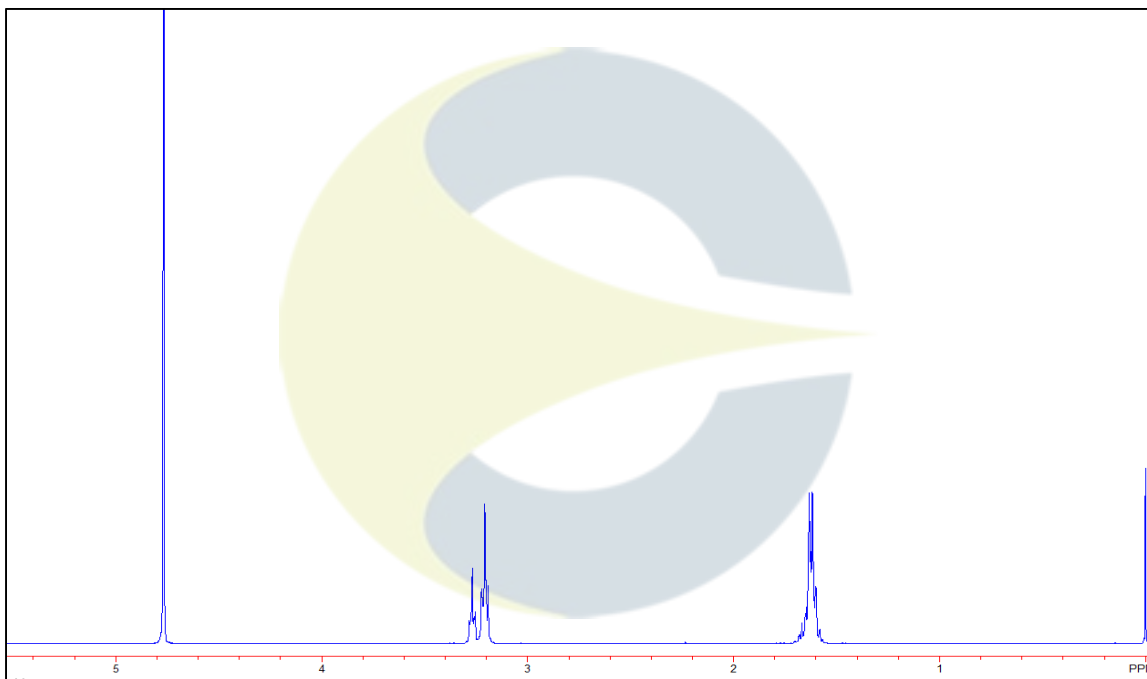
MASS SPECTRUM OF L-ARGININE (CDXA-17-009520)



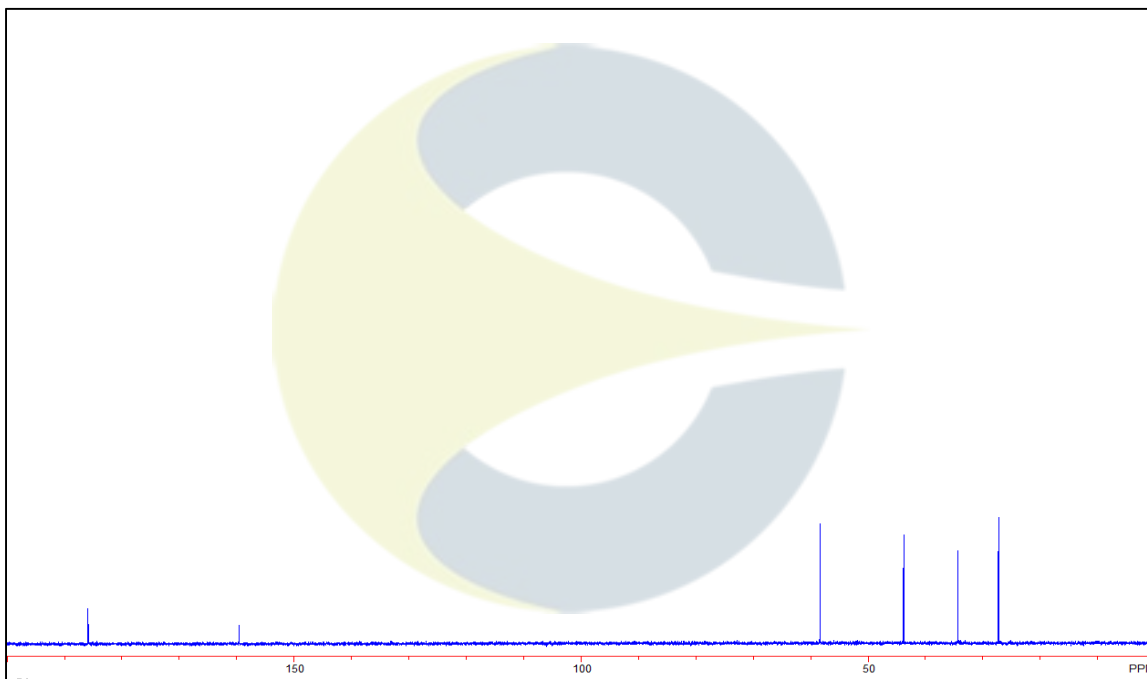
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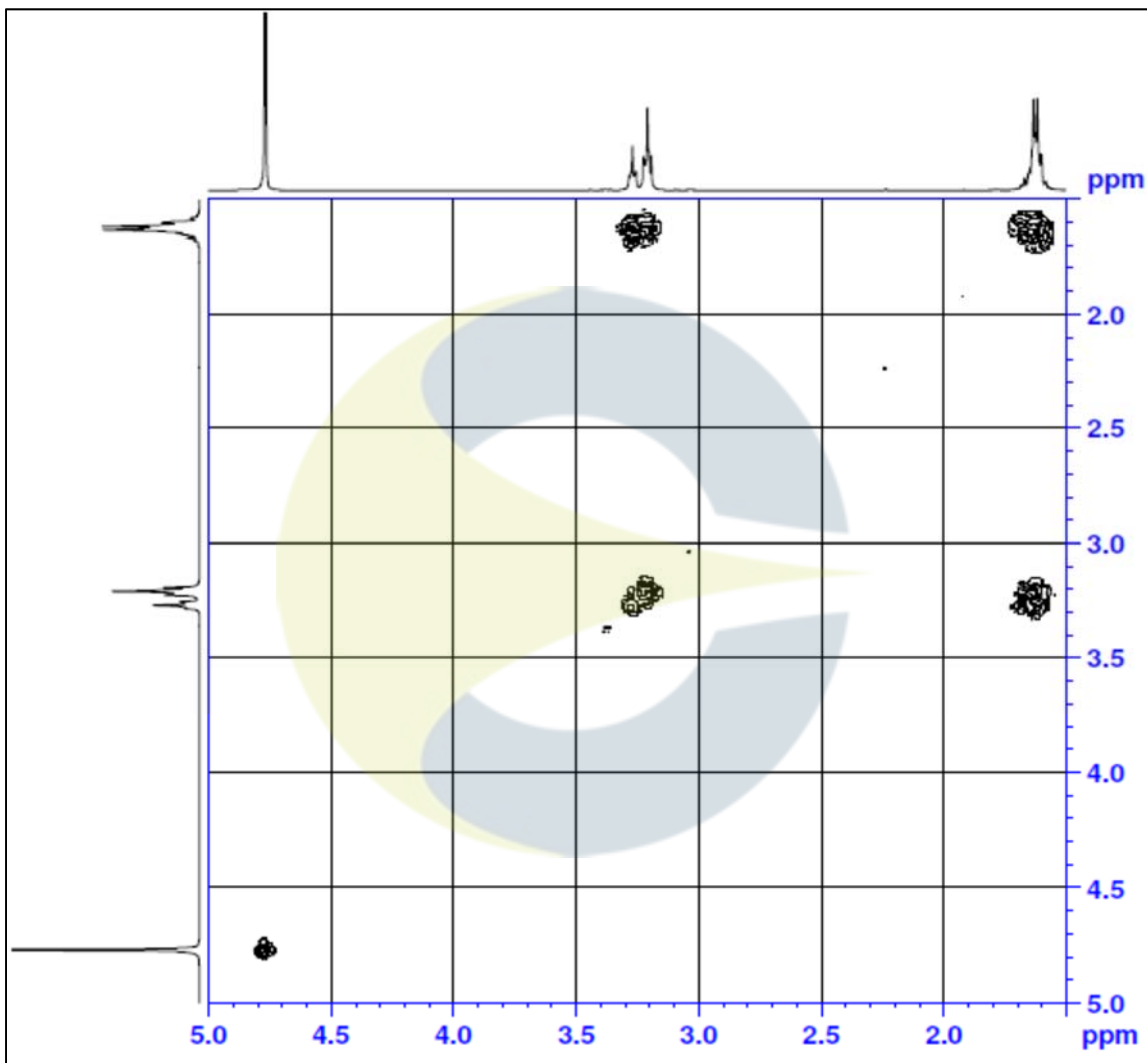
¹H-NMR SPECTRUM OF L-ARGININE (CDXA-17-009520) IN D₂O



¹³C-NMR SPECTRUM L-ARGININE (CDXA-17-009520) IN D₂O



COSY-NMR SPECTRUM OF L-ARGININE (CDXA-17-009520) IN D₂O



REVISION HISTORY

<u>Revision History</u>	<u>Date of Revision</u>	<u>Document/Changes</u>
00	08/21/2017	New report