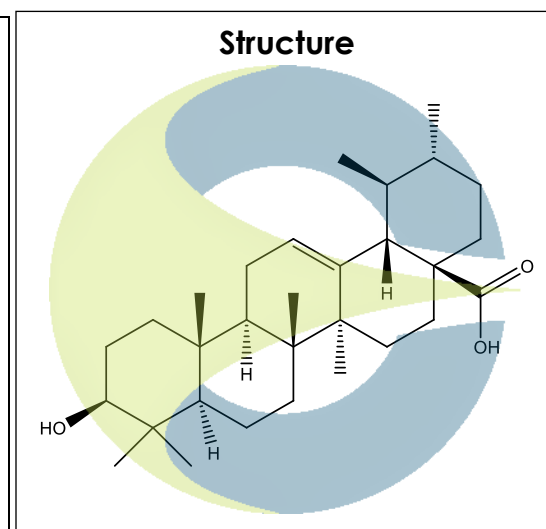


Certificate of Analysis

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PRODUCT NAME	Ursolic acid
PART NUMBER	00021600
STANDARD TYPE	Primary (P)
LOT NUMBER	00021600-022
REPORT NUMBER	CDXA-RSS-3985-03
SAMPLE NUMBER	CDXA-10-2823
DATE OF SAMPLE	05/05/2010
DATE OF RE-EVALUATION	06/09/2014 (1 st); 08/15/2018 (2 nd); 07/07/2022 (3 rd)
DATE OF REPORT	08/22/2022



CHEMICAL NAMES	(3β)-3-Hydroxyurs-12-en-28-oic acid; Bungeolic acid; Formosolic acid; Malol; Prunol; Urson
CHEMICAL FORMULA	C ₃₀ H ₄₈ O ₃
MOLECULAR WEIGHT (MW)	456.70
CHEMICAL FAMILY	Triterpenes
CAS NUMBER	[77-52-1]
EC#(EINECS)	201-034-0
RTECS	YU9520000

ANALYTICAL RESULTS

TEST	METHOD	SPECIFICATION	RESULT
Adjusted Purity	NA	≥ 85%	95.1%
HPLC	0.700.10.2.METH22	≥ 90%	96.7%
NMR	0.700.12.4	Conforms to structure	Conforms to structure
Mass Spectrum	Direct Infusion, ESI (-)	Conforms	Conforms
Residual Solvent*	99.1-CD-3.0-000115	NA	EtOH -1.2%
Water	0.700.12.37	NA	0.5%
Appearance	NA	NA	White powder

*Testing performed at an ISO 17025 accredited subcontracted laboratory.

 ADJUSTED PURITY: 95.1% IS BASED ON (100 - 1.2 SOLVENTS - 0.5 WATER) X 96.7% HPLC **STORAGE CONDITIONS**
STORAGE Room Temperature in a dry place.

EXPIRATION DATE 07/2027 under the above conditions.

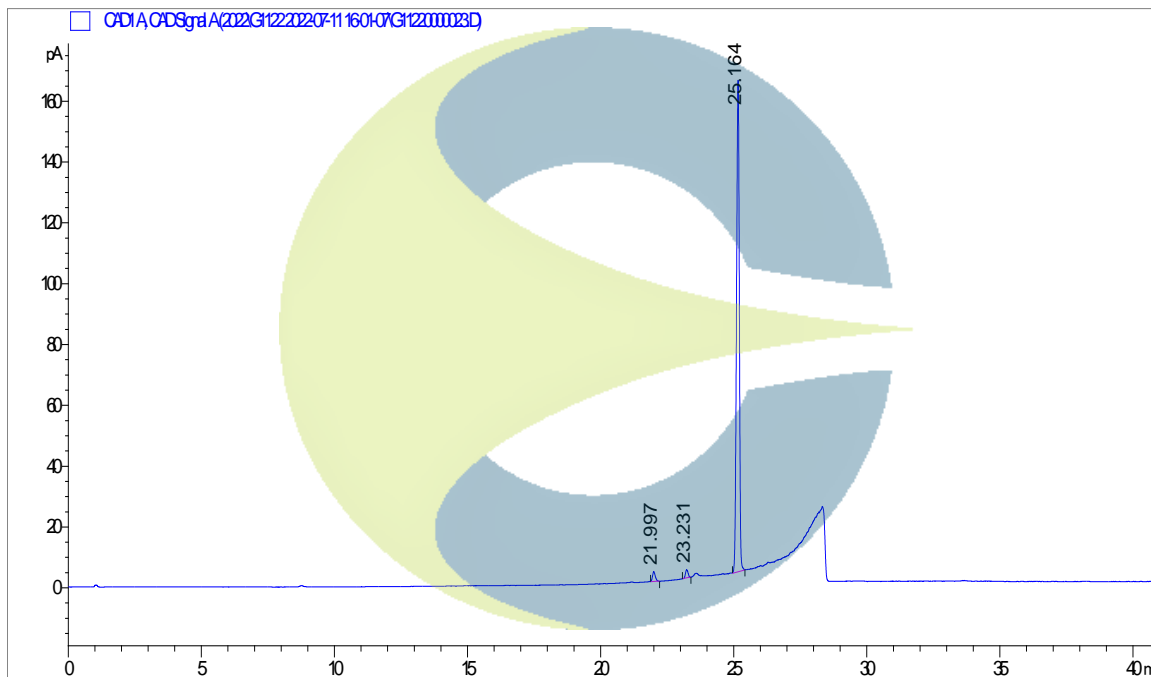
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ANALYTICAL CONDITIONS

INSTRUMENT	AGILENT 1260 HPLC UV-VIS (DAD) CONNECTED TO DIONEX CORONA VEO CHARGED AEROSOL DETECTOR (CAD); AGILENT 1100 ION TRAP
COLUMN	Phenomenex Luna C18(2) 150 x 2.00 mm, 5 µm particle size
MOBILE PHASE	A - 0.1% Trifluoroacetic acid in Ultrapure water, B - Acetonitrile; Isocratic 5% B for 5 minutes, then increasing to 95% B over 20 minutes. Hold at 95% B for 15 minutes, then decreasing to 5% B over 1 minute.
COLUMN TEMP.	60 °C
FLOW RATE	0.4 mL/minute
INJECTION VOL.	2.0 µL
INJECTION CONC.	1.0 mg/mL in Methanol
DETECTION	CAD

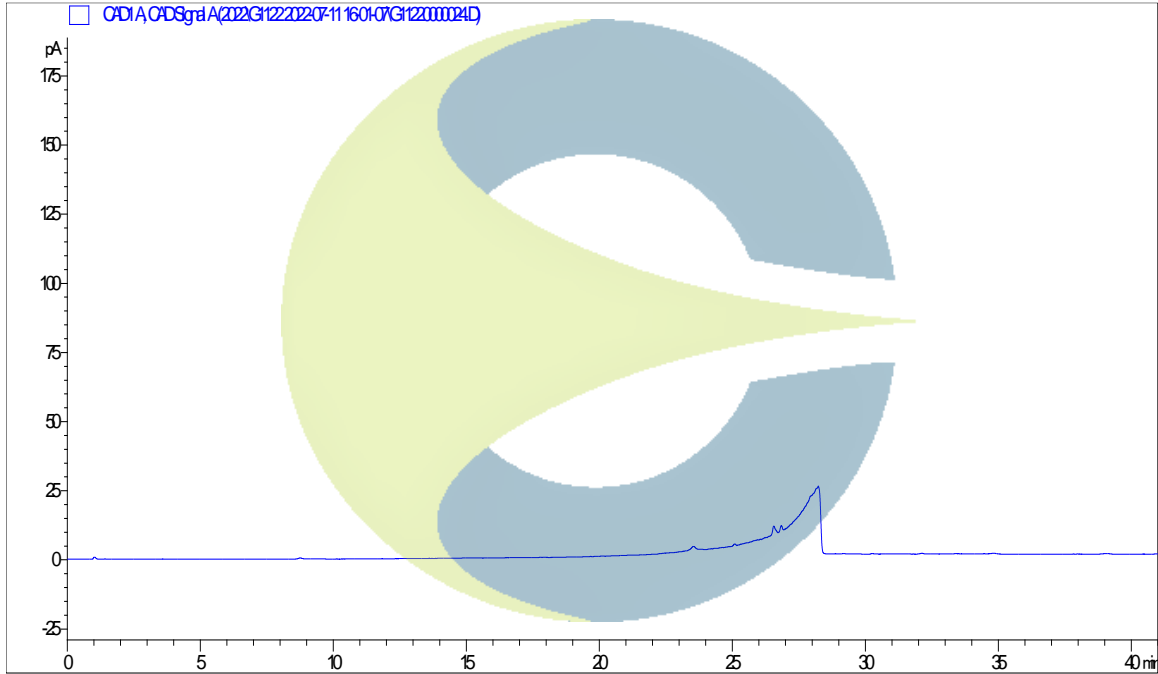
HPLC CHROMATOGRAM OF URSOLIC ACID (CDXA-10-2823)


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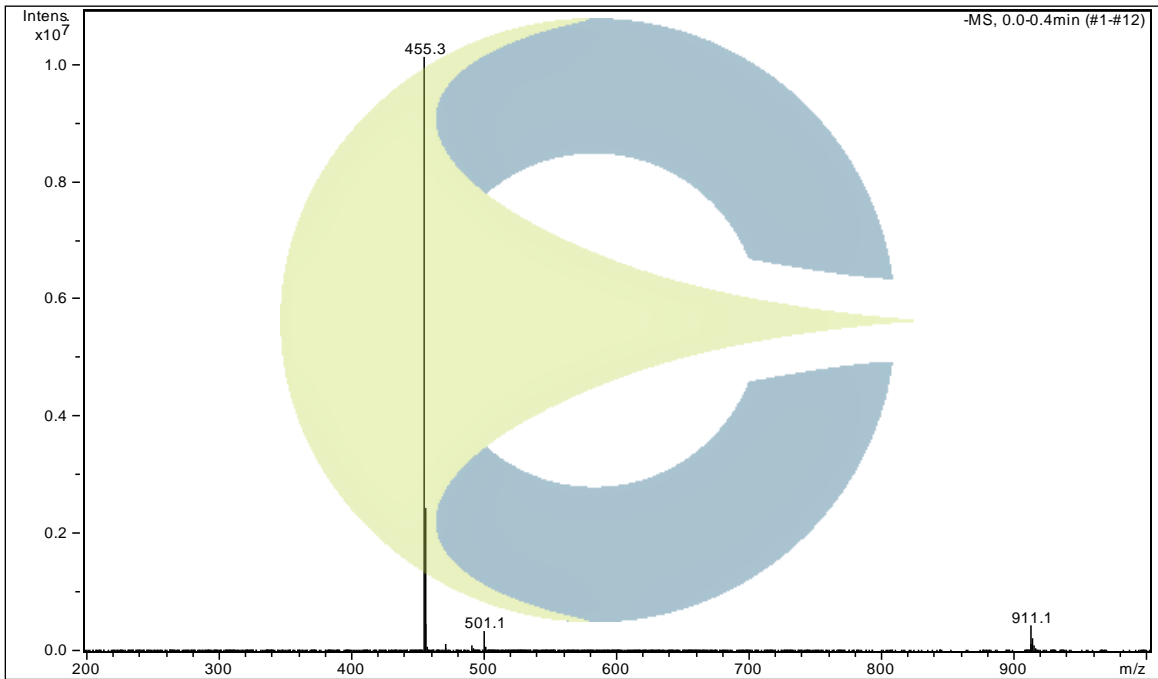
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HPLC CHROMATOGRAM OF DILUENT BLANK



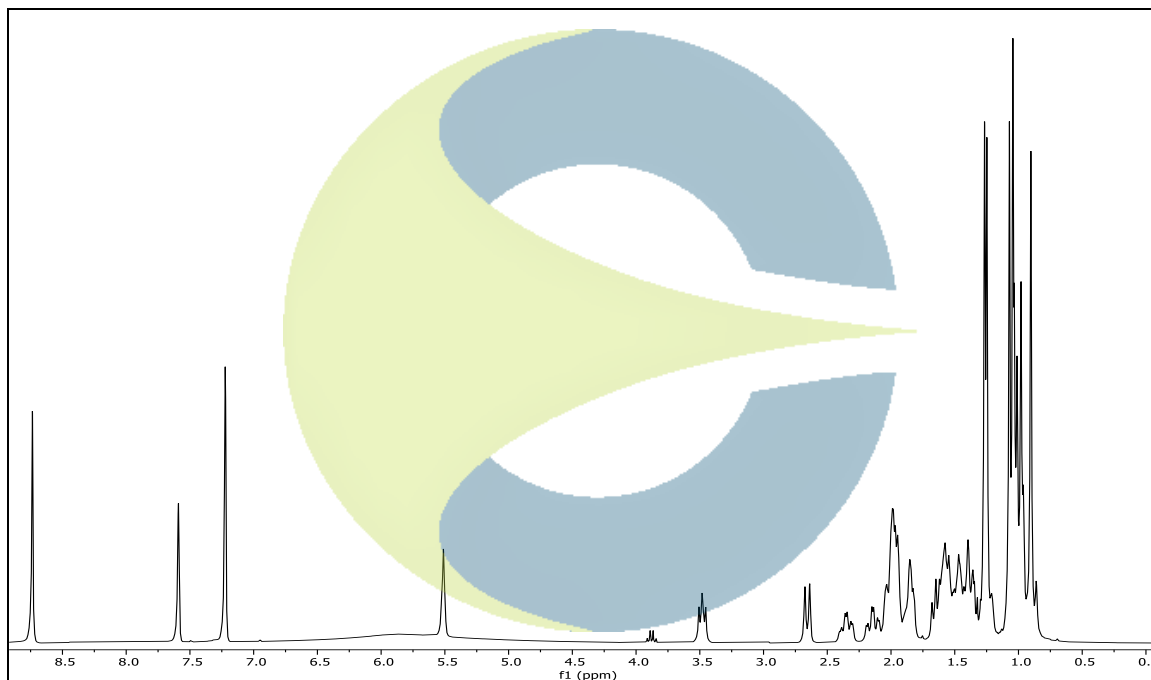
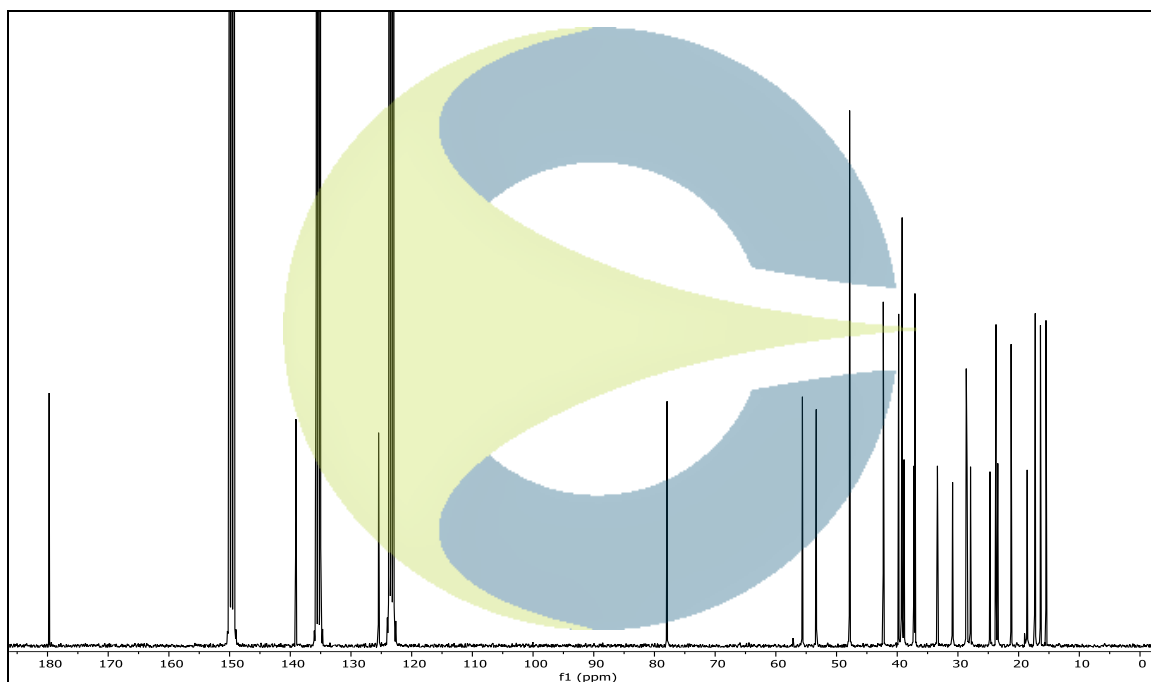
MASS SPECTRUM OF URSOLIC ACID (CDXA-10-2823)



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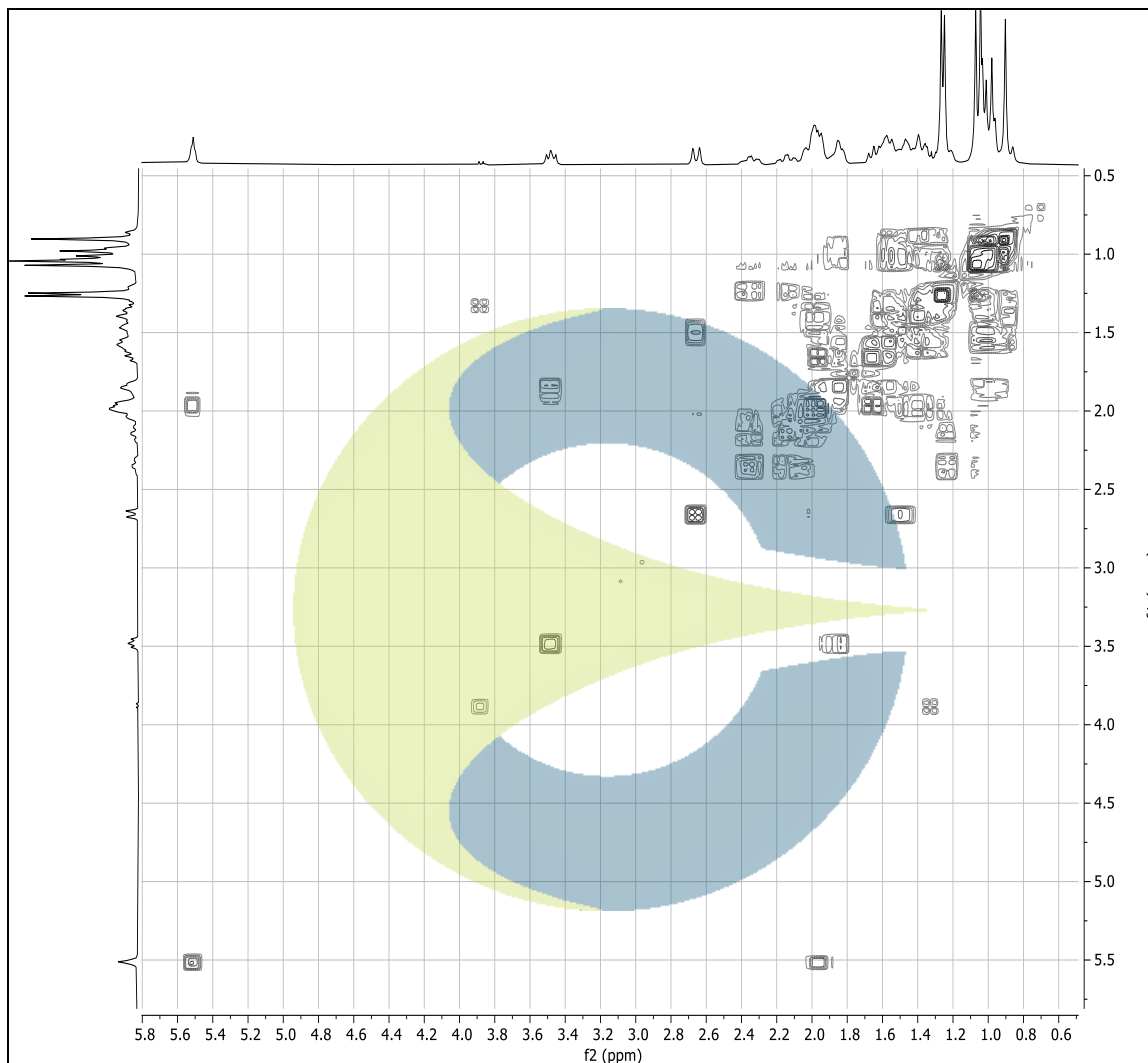
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¹H-NMR SPECTRUM OF URSOLIC ACID (CDXA-10-2823) IN PYRIDINE-*d*₅**¹³C-NMR SPECTRUM OF URSOLIC ACID (CDXA-10-2823) IN PYRIDINE-*d*₅**

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COSY-NMR SPECTRUM OF URSOLIC ACID (CDXA-10-2823) IN PYRIDINE-*d*₅

REVISION HISTORY

<u>Revision History</u>	<u>Date of Revision</u>	<u>Document/Changes</u>
00	05/20/2010	New report
01	06/12/2014	Passed reevaluation; updated expiration date
02	09/22/2018	Passed second reevaluation. Updated analytical results, analytical conditions, chemical structure format, expiration date and chromatograms. Removed melting point.
03	08/22/2022	Passed third re-evaluation by HPLC, KF, NMR. Updated expiration date, analytical results, analytical conditions, and chromatograms.

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