



Reference Standard Product Grades

ChromaDex™ currently offers several different grades of reference standards. Choosing the correct Reference Standard is essential to the success of your research project or quality management program. Below is a listing of Product Grades offered by ChromaDex™ with examples of intended use for each. Let us help make your Reference Standard selection easy by contacting us with any questions specific to the needs of your project.

Primary Standards (P)

As the highest grade reference standards, the purity of Primary standards is well characterized and documented. All ChromaDex™ Primary standards come with a complete certificate of analysis detailing adjusted total purity as calculated by HPLC, Karl Fischer (water content), and GC (residual solvent), including Mass Spec. and NMR profiles. Primary standards are useful for:

- Accurate quantitative validation
- Method validation
- Quality control
- Analyte identification
- Characterization of “in-house” or “working” standards
- Equipment and instrument calibration
- Proficiency testing
- Analytical method development

Secondary Standards (SH, SG, and ST)

A step below Primary, ChromaDex™ Secondary standards list an approximate purity determined by either HPLC, GC, or TLC only. They do not come with the rigorous testing and characterization as provided with the Primary standards. Secondary standards are cost effective analytical tools, however their lack of full documentation restricts their use to select analytical functions including:

- Basic starting method development
- Stability studies (pure compound stability)
- In vitro or in vivo studies
- Identity testing by TLC
- For characterization as a “working” or “in-house” standard

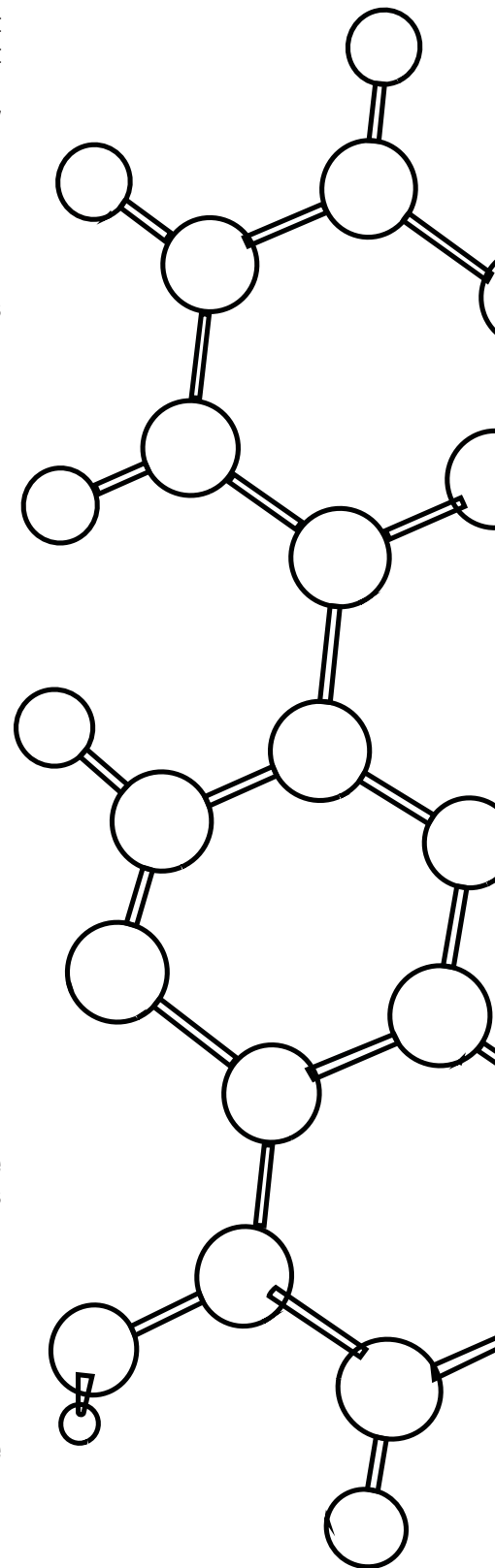
Reagent Grade Chemicals (RG)

Reagent grade chemicals are not analytical standards due to the lack of documentation and characterization needed for quantitative calculations. The certificate of analysis for Reagent grade chemicals contains basic physical properties. Due to the lack of purities, Reagent grade chemicals SHOULD NOT be used for quantitative purposes. Reagent grade chemicals are useful for:

- Basic research and method development
- As a “working” or “in-house” standard only after characterization by a Primary grade standard

American Herbal Pharmacopoeia (AHP)

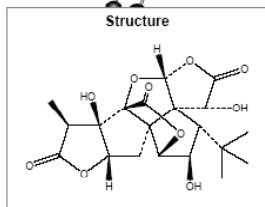
All AHP grade standards are Primary grade standards that have been independently verified by the American Herbal Pharmacopoeia. Once the purity and identity of the Primary standard has received approval from AHP, it will bear the AHP Verified logo. The certificate of analysis will also bear the AHP verified statement.



Example: Primary Grade Certificate of Analysis



PRODUCT Ginkgolide J
PART NUMBER 0000/195
STANDARD TYPE Primary (P)
LOT NUMBER ██████████
ASSAY METHOD CDXA-RSS-759-00
CDXA NUMBR CDXA-06-0285
DATE OF SAMPLE 03/06/2008
DATE OF REPORT 03/29/2008



CHEMICAL NAME Ginkgolide J
OTHER NAME 1-Deoxyginkgolide C
CHEMICAL FORMULA C₂₀H₂₄O₁₀
MOLECULAR WEIGHT (MW) 424.40
PUBLISHED MELTING POINT 320 °C
CAS NUMBER [107439-79-9]
CHEMICAL FAMILY Terpenoids
FROM *Ginkgo biloba*

ANALYTICAL CONDITIONS

TEST	METHOD	SPECIFICATION	RESULT
Adjusted Purity	NA	NA	88.9%
LC/MS Purity	CDXA-CPM-085-00	NA	94.0%
NMR	NA	Conforms	Conforms
Mass Spec.	CDXA-CPM-065-00	Conforms	Conforms
Residual solvent	CDXA-AM-001-00	NA	Methanol – 0.1%
Water	CDXA-AM-089-00	NA	7.5%
Appearance	NA	NA	White Powder

ADJUSTED PURITY: 88.9% IS BASED ON (100% – 0.1% SOLVENTS – 7.5% WATER) X 94.0% LC/MS PURITY

STORAGE CONDITIONS

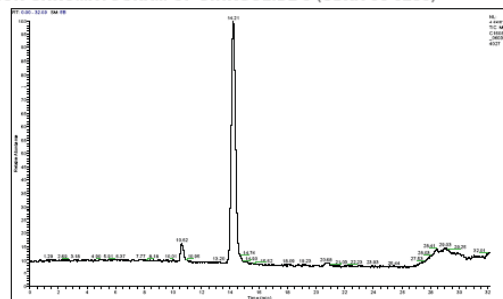
STORAGE -20 °C in a dry place
EXPIRATION DATE 03/2009



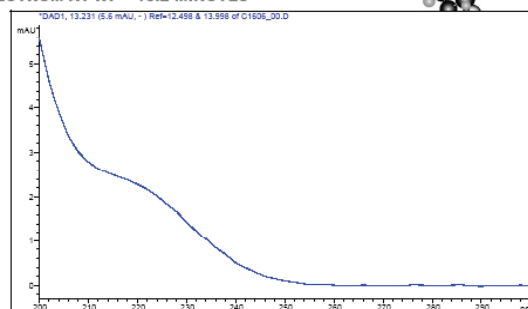
ANALYTICAL CONDITIONS

INSTRUMENT AGILENT 1100 HPLC, THERMO-FINNING LCQ-DECA ION TRAP MASS SPECTROMETER (CURIE)
COLUMN Phenomenex Luna C18(2), 250 x 4.6 mm, 5 µm particle size
MOBILE PHASE A – Milli-Q Water, B – Methanol; 25% B increasing to 48% B over 23 minutes, then increasing to 75% B over 2 minutes
COLUMN TEMPERATURE 25 °C
FLOW RATE 1.0 mL/minute
INJECTION VOLUME 2 µL
INJECTION CONCENTRATION 1.1 mg/mL in methanol
DETECTION Mass Spectrometric Using Electrospray Ionization – Positive Ion Detection

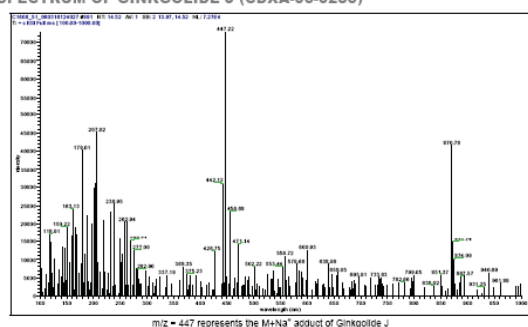
TOTAL ION CHROMATOGRAM OF GINKGOLIDE J (CDXA-06-0285)



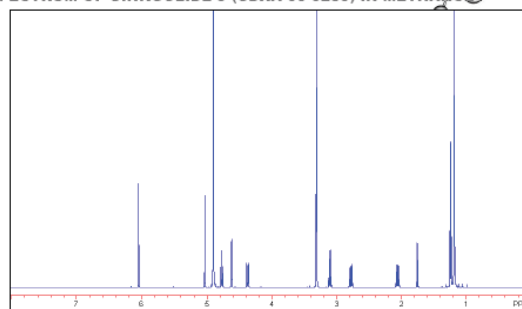
UV SPECTRUM AT RT = 13.2 MINUTES



MASS SPECTRUM OF GINKGOLIDE J (CDXA-06-0285)



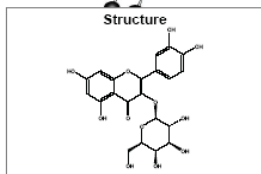
NMR SPECTRUM OF GINKGOLIDE J (CDXA-06-0285) IN METHANOL



Example: Secondary Grade Certificate of Analysis



PRODUCT	Hyperoside
PART NUMBER	00008915
STANDARD TYPE	Secondary (SH)
LOT NUMBER	
ASSAY METHOD	CDXA-RSS-388
DATE OF SAMPLE	07/08/2005
DATE OF REPORT	07/11/2005



CHEMICAL NAME	3-O-β-D-Galactopyranosyl-3',4',6,7-tetrahydroxyflavone
OTHER NAME	Hyperoside; Hyperin; Queroetin 3-galactoside
CHEMICAL FORMULA	C ₂₁ H ₂₀ O ₁₂
MOLECULAR WEIGHT (MW)	484.38
PUBLISHED MELTING POINT	232-233 °C
CAS NUMBER	[482-36-0]
CHEMICAL FAMILY	Flavonoids
FROM	Hypericum spp.

ANALYTICAL CONDITIONS

TEST	METHOD	SPECIFICATION	RESULT
HPLC	CDXA-AM-009-00	NA	97.3%
Appearance	NA	NA	Yellow Powder

STORAGE CONDITIONS

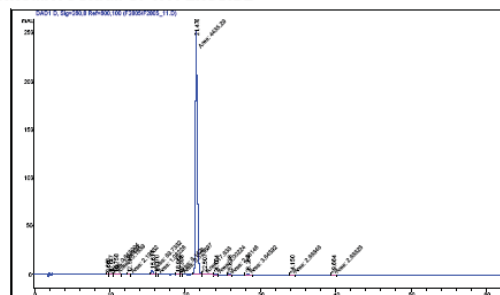
STORAGE	Room Temperature
EXPIRATION DATE	07/2008



ANALYTICAL CONDITIONS

INSTRUMENT	AGILENT 1100 HPLC UV-VIS (DAD) DETECTOR (GALILEI), FINNIGAN LCQ-DECA (CURIE)
COLUMN	Phenomenex Luna C18(2) 250 x 4.6 mm, 5 μm particle size, S/N 196208-15
MOBILE PHASE	A - 0.1% TPA in Milli-Q H ₂ O, B - 0.1% TPA in Acetonitrile, 10% B increasing to 70% B over 60 minutes
COLUMN TEMP.	40 °C
FLOW RATE	1.6 mL/minute
INJECTION VOL.	5 μL
INJECTION CONC.	0.6 mg/mL in methanol
DETECTION	200 ± 4 nm

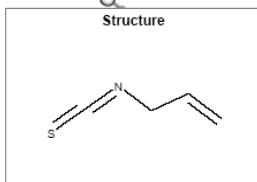
HPLC CHROMATOGRAM OF HYPEROSIDE



Example: Reagent Grade Certificate of Analysis



PRODUCT	Allyl isothiocyanate
PART NUMBER	00001808
STANDARD TYPE	Reagent Grade (RG)
LOT NUMBER	
REPORT NUMBER	CDXA-RSS-1175-00
DATE OF SAMPLE	00/01/2000
DATE OF REPORT	09/19/2008



NAME	Allyl isothiocyanate
OTHER NAME	1-Propene, 3-isothiocyanato-; Allyl isosulfocyanate; Allylsenevol; Mustard oil
CHEMICAL FORMULA	C ₄ H ₇ NS
MOLECULAR WEIGHT (MW)	99.16
PUBLISHED MELTING POINT	-80°C
CAS NUMBER	[57-06-7]
EINECS	200-309-2
CHEMICAL FAMILY	Anthraquinones
RTECS	MX82256000; Flammable; Irritant and skin allergen; Exp. reproductive and teratogenic effects; Goitrogenic activity

STORAGE CONDITIONS

STORAGE	+4°C in a dry place.
EXPIRATION DATE	06/2009 under the above conditions.

Note – Reagent Grade (RG) chemicals are not guaranteed as quantitative standards. This product line has been developed for research and qualitative purposes only.