

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)

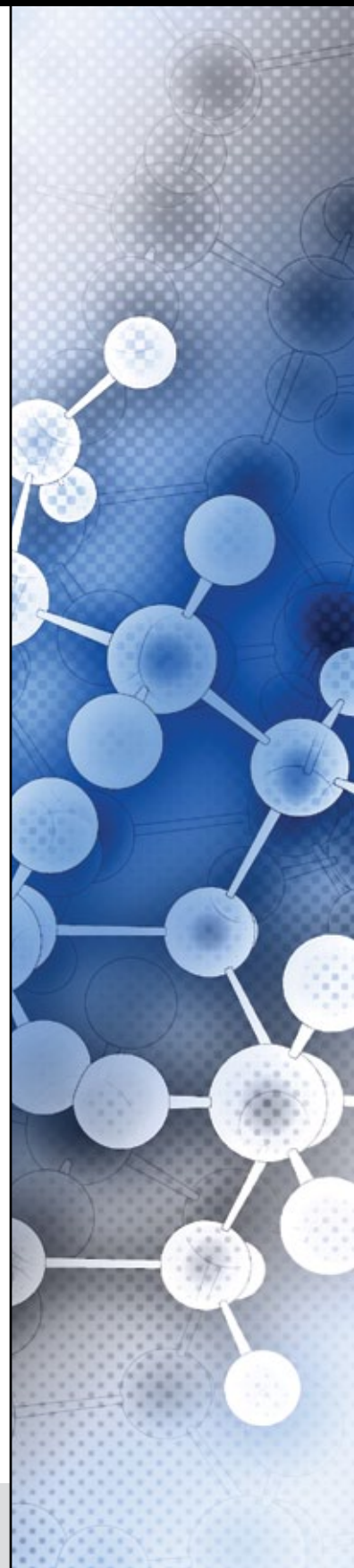
As the highest grade reference standards, the purity of Primary standards is well characterized and documented. All ChromaDex™ Primary standards come with a complete certificate of analysis detailing adjusted total purity as calculated by HPLC, Karl Fischer (water content), and GC (residual solvent),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



Reference Standard Product Grades

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

Food Grade (FG)

Food Grade chemicals are similar to Secondary standards listing the approximate purity determined by either HPLC, GC, or TLC. The physical characteristics are described (appearance, odor, taste, and loss on drying) as well as microbiological results (total plate count, yeast, mold, salmonella, and E. coli). Food Grade 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 an “in-house” or “working” 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.



Reference Standard Product Grades

Example: Primary Grade Certificate of Analysis

ChromaDex™ *certificate of analysis*

PRODUCT Ginkgolide J
PART NUMBER 00007186
STANDARD TYPE Primary (P)
LOT NUMBER
ASSAY METHOD CDXA-RSS-759-00
CDXA NUMBR CDXA-06-0285
DATE OF SAMPLE 03/06/2006
DATE OF REPORT 03/29/2006

CHEMICAL NAME Ginkgolide J
OTHER NAME 1-Deoxyginkgolide C
CHEMICAL FORMULA C₂₀H₃₀O₁₀
MOLECULAR WEIGHT (MW) 424.40
PUBLISHED MELTING POINT 320 °C
CAS NUMBER [107438-79-9]
CHEMICAL FAMILY Terpenoids
FROM Ginkgo biloba

ANALYTICAL CONDITIONS

TEST	METHOD	SPECIFICATION	RESULT
Adjusted Purity	NA	NA	86.9%
LC/MS Purity	CDXA-CPM-065-00	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: 86.9% 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

Structure

ChromaDex™ *certificate of analysis*

ANALYTICAL CONDITIONS

INSTRUMENT AGILENT 1100 HPLC, THERMO-FINNING LCO-DECO ION TRAP MASS SPECTROMETER (CURIE)
COLUMN Phenomenex Luna C18(2), 250 x 4.6 mm, 5 µm particle size
MOBILE PHASE A – Mill-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)

ChromaDex™ *certificate of analysis*

UV SPECTRUM AT RT = 13.2 MINUTES

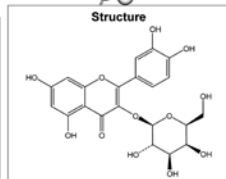
MASS SPECTRUM OF GINKGOLIDE J (CDXA-06-0285)

Reference Standard Product Grades

Example: Secondary Grade Certificate of Analysis



PRODUCT	Hyperoside
PART NUMBER	00008915
STANDARD TYPE	Secondary (SH)
LOT NUMBER	08915-418
REPORT NUMBER	CDXA-RSS-388-00
CDXA NUMBER	CDXA-05-0503
DATE OF SAMPLE	07/08/2005
DATE OF REPORT	07/11/2005



NAME	Hyperoside
OTHER NAME	3-O-β-D-Galactopyranosyloxy-3',4',5,7-tetrahydroxyflavone; Hyperin; Quercetin-β-D-galactoside
CHEMICAL FORMULA	C ₂₁ H ₃₂ O ₁₂
MOLECULAR WEIGHT (MW)	464.38
PUBLISHED MELTING POINT	232-233 °C
CAS NUMBER	[482-36-0]
EINECS	207-580-6
CHEMICAL FAMILY	Flavonoids
RTECS	DJ2075806
FROM	<i>Hypericum</i> spp.

ANALYTICAL RESULTS

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

STORAGE CONDITIONS

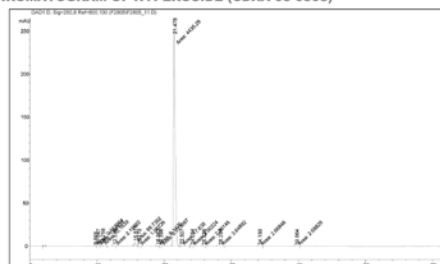
STORAGE	Room Temperature in a dry place.
EXPIRATION DATE	07/2010 under the above conditions.



ANALYTICAL CONDITIONS

INSTRUMENT	AGILENT 1100 HPLC UV-VIS (DAD) DETECTOR (GALILEI), FINNIGAN LCO-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% Trifluoroacetic acid in Milli-Q water, B – 0.1% Trifluoroacetic acid in Acetonitrile; 10% B increasing to 70% B over 60 minutes.
COLUMN TEMP.	40 °C
FLOW RATE	1.5 mL/minute
INJECTION VOL.	5 μL
INJECTION CONC.	0.6 mg/mL in methanol
DETECTION	260 ± 4 nm

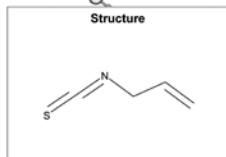
HPLC CHROMATOGRAM OF HYPEROSIDE (CDXA-05-0503)



Example: Reagent Grade Certificate of Analysis



PRODUCT	Allyl isothiocyanate
PART NUMBER	00001608
STANDARD TYPE	Reagent Grade (RG)
LOT NUMBER	01608-322
REPORT NUMBER	CDXA-RSS-1175-00
DATE OF SAMPLE	06/01/2000
DATE OF REPORT	09/19/2006



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	NX8225000; Flammable; Irritant and skin allergen; Exp. reproductive and teratogenic effects; Gotrogenic 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.