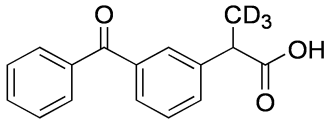
Frontier BioPharm LLC
6013 Atwood Drive, Suite 300 • Richmond, KY 40475 • phone 859.623.0409 | fax 888.315.8599 • www.frontierbiopharm.com
mailing/billing address | P.O.Box 614 • Richmond, Ky 40476-0614

CERTIFICATE OF ANALYSIS

Ketoprofen-d_3

0.102 mg/mL in acetonitrile

Sample Identity:	KD-5025 Lot No.: KD-100496-01
Chemical Identity:	Ketoprofen-d_3
Storage Condition:	Protect from light, freeze
Chemical Purity:	99.4% by LC/UV
Residual solvents (TGA)	< 0.1%
Isotopic Purity	>99% d_3
Micro Ash Determination	< 0.1% residue on ignition.
Melting Point	95-96°C
Date of Analysis:	16 July, 2013
Solution Re-analysis	16 July, 2016



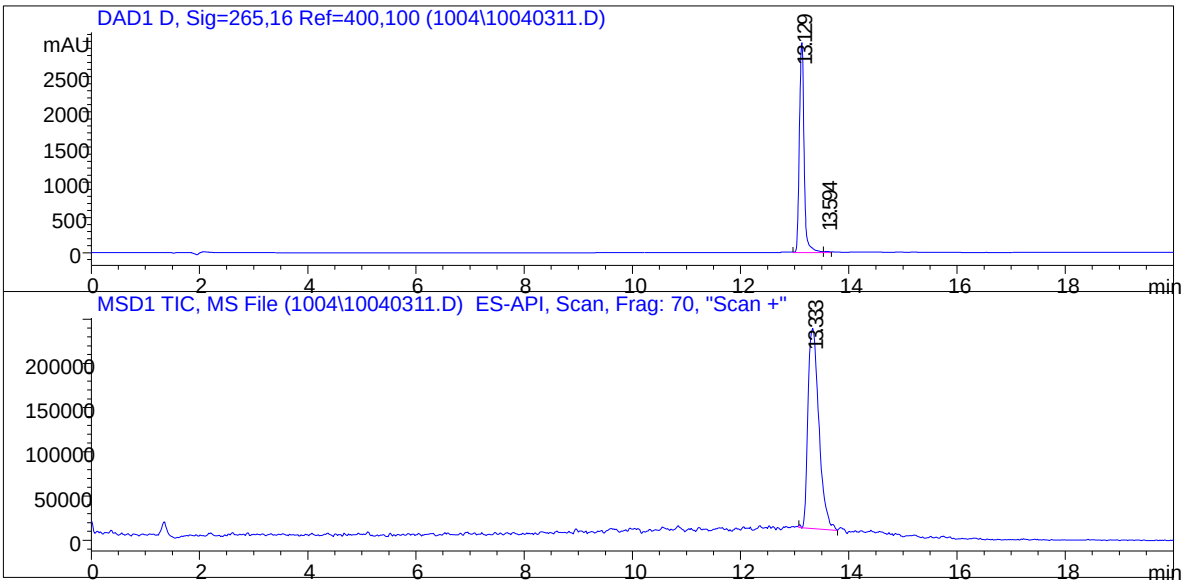
Purity (HPLCUV 265 nm)	Prepared Concentration*	Analyzed Concentration**
99.4% (As the free base)	0.102 mg/mL (±0.003 mg/mL)	0.102 mg/mL (±0.003 mg/mL)

* Masses are determined using balances calibrated with NIST traceable weights using a minimum weight following USP <41> guidelines, The prepared concentration is corrected for residual solvents, chromatographic and chemical purity.
** Concentration values are determined by independent calibration curves. It is suggested that the prepared concentration value be used.
This compound has not been sufficiently characterized to be used as a quantitative concentration standard. Use only as an internal standard.

Approved: _____ 07-16-2013
Rodney L. Eisenberg, Ph.D. Date
Director

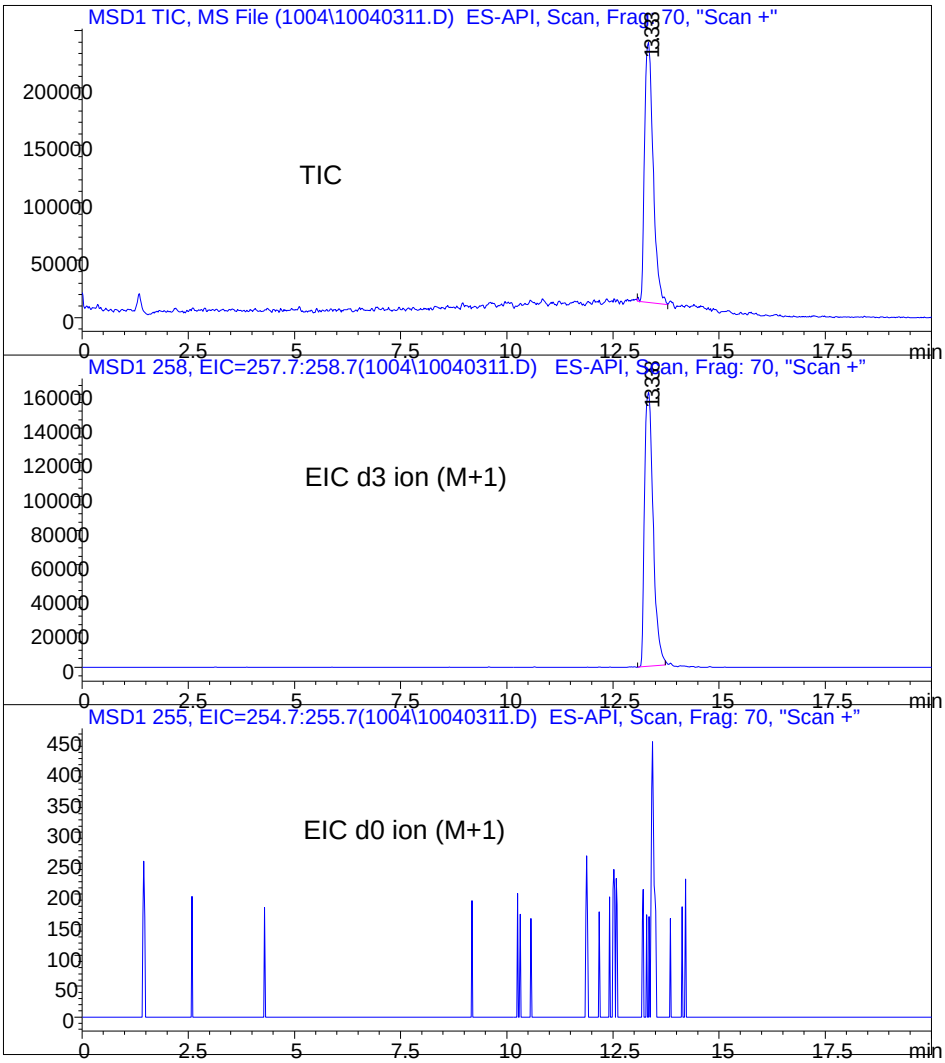
Spectral and Physical Data

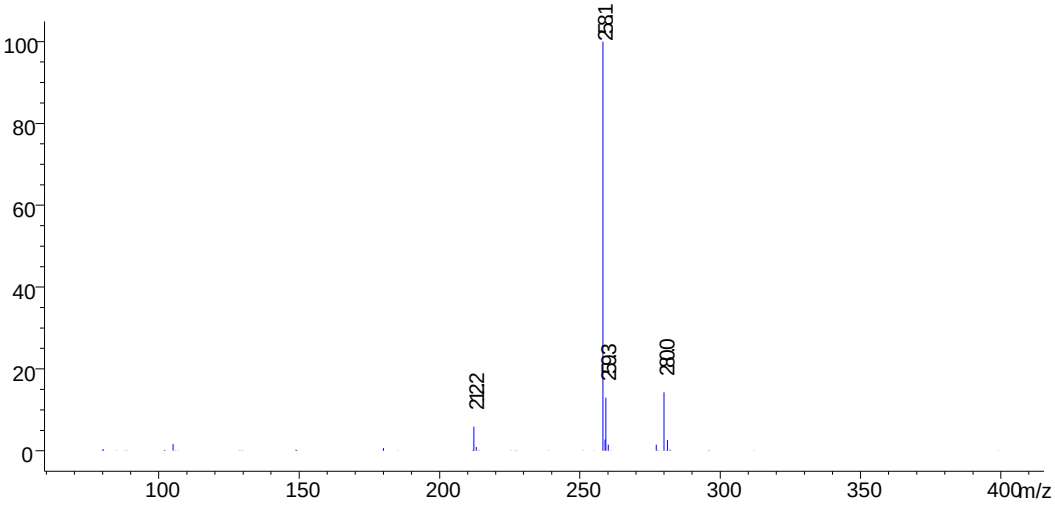
LCMS Data Column:
Phenomenex C18 2.1 x 150 mm 5µ Hydro RP.
Flow rate 0.250 ml/min,
Gradient: solvents: A: Methanol, 0.1% Formic acid. B: Water, 0.1% Formic Acid
25% A to 95% A over 10, hold until 17 min then initial conditions.
UV Detection (265 nm)



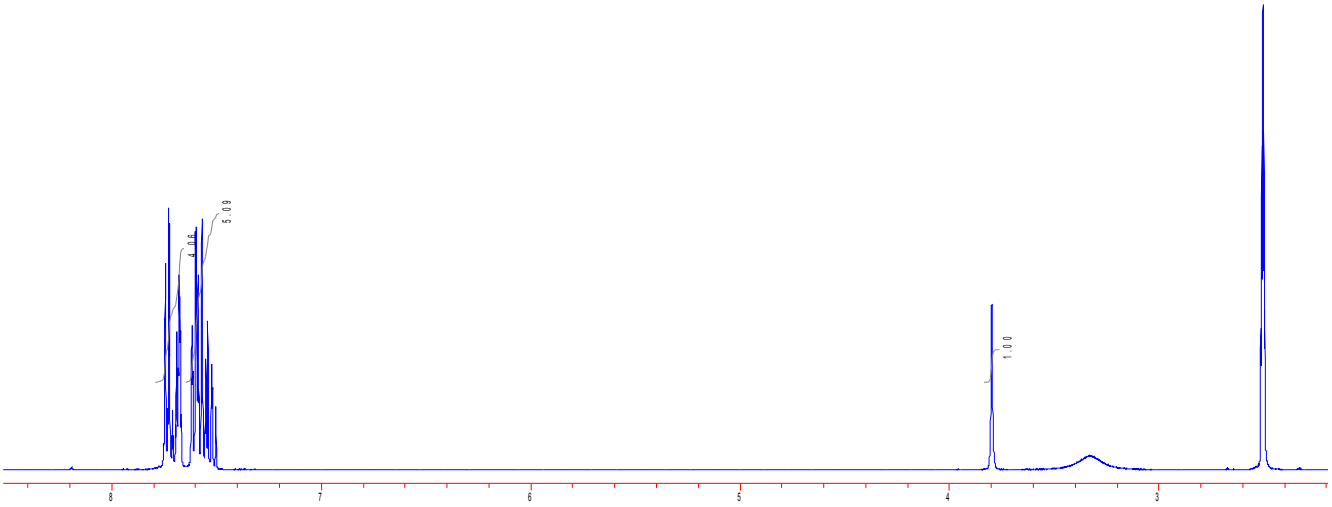
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	13.129	VV	0.0950	1.81584e4	2984.10474	99.4362
2	13.594	VV	0.0986	102.95673	14.90507	0.5638
Totals :				1.82614e4	2999.00981	

Mass spectral detection (ESI +)





^{1}H-NMR (400 MHz, DMSO-d_6)



^{13}C-NMR (100 MHz) Conforms to Structure
FT-IR (KBr) Conforms to Structure

COA history:
11-19-20101.0. Original COA
07-16-2013 v1.1 Solution analyzed by hplc, re-analysis date updated to 07-16-2016.