Certificate of Analysis

Product Name: **(*R*)-(-)-Ketamine hydrochloride** **Catalog No.: 6751** **Batch No.: 1**

CAS Number: 33795-24-3 EC Number: 625-831-1

IUPAC Name: (*R*)-(-)-2-(2-Chlorophenyl)-2-(methylamino)cyclohexanone hydrochloride

1. PHYSICAL AND CHEMICAL PROPERTIES

Batch Molecular Formula: $C_{13}H_{16}ClNO.HCl$

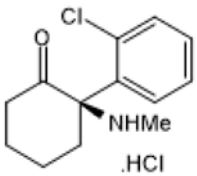
Batch Molecular Weight: 274.19

Physical Appearance: White solid

Solubility: water to 100 mM
DMSO to 100 mM
ethanol to 50 mM

Storage: Store at RT

Batch Molecular Structure:



2. ANALYTICAL DATA

HPLC: Shows 99.8% purity

Chiral HPLC: Shows 100% purity

^{1}H NMR: Consistent with structure

Mass Spectrum: Consistent with structure

Optical Rotation: $[\alpha]_D$ = -89.3 (Concentration = 2, Solvent = Water)

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IUPAC Name: (*R*)-(-)-2-(2-Chlorophenyl)-2-(methylamino)cyclohexanone hydrochloride

Description:

(R)-(-)-Ketamine hydrochloride is a NMDA antagonist (K_i = 1.4 µM); exhibits more potent and longer lasting antidepressant effects compared to its enantiomer (S)-ketamine in vivo. Also may not display the psychotomimetic or addictive side effects associated with (S)-ketamine. (R)-(-)-Ketamine hydrochloride upregulates KCNQ2 channels in mouse ventral hippocampal glutamatergic neurons in vitro and in vivo. It exerts its sustained antidepressant effetcs via KCNQ2 cell type specific regulation.

Physical and Chemical Properties:

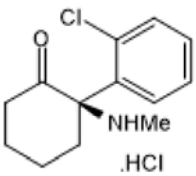
Batch Molecular Formula: $C_{13}H_{16}ClNO.HCl$

Batch Molecular Weight: 274.19

Physical Appearance: White solid

Minimum Purity: ≥99%

Batch Molecular Structure:



Storage: Store at RT

Solubility & Usage Info:

water to 100 mM
DMSO to 100 mM
ethanol to 50 mM

Stability and Solubility Advice:

Some solutions can be difficult to obtain and can be encouraged by rapid stirring, sonication or gentle warming (in a 45-60°C water bath).

Information concerning product stability, particularly in solution, has rarely been reported and in most cases we can only offer a general guide. Our standard recommendations are:

SOLIDS: Provided storage is as stated on the product label and the vial is kept tightly sealed, the product can be stored for up to 6 months from date of receipt.

SOLUTIONS: We recommend that stock solutions, once prepared, are stored aliquoted in tightly sealed vials at -20°C or below and used within 1 month. Wherever possible solutions should be made up and used on the same day.

Other Information:

INFORMATION FOR CUSTOMERS IN THE UK ONLY

This product is a Schedule 2 Home Office controlled substance and customers in the UK are required to hold the relevant licence or be exempt from restrictions in order to purchase and possess this material.

References:

Lopez *et al* (2022) Ketamine exerts its sustained antidepressant effects via cell-type-specific regulation of Kcnq2. Neuron ***110*** 2283. PMID: 35649415.

Xiong *et al* (2018) Comparison of rapid and long-lasting antidepressant effects of negative modulators of α5-containing $GABA_A$ receptors and (*R*)-ketamine in a chronic social defeat stress model. Pharmacol.Biochem.Behav. ***175*** 139. PMID: 30359627.

Zanos *et al* (2016) NMDAR inhibition-independent antidepressant actions of ketamine metabolites. Nature ***533*** 481. PMID: 27144355.