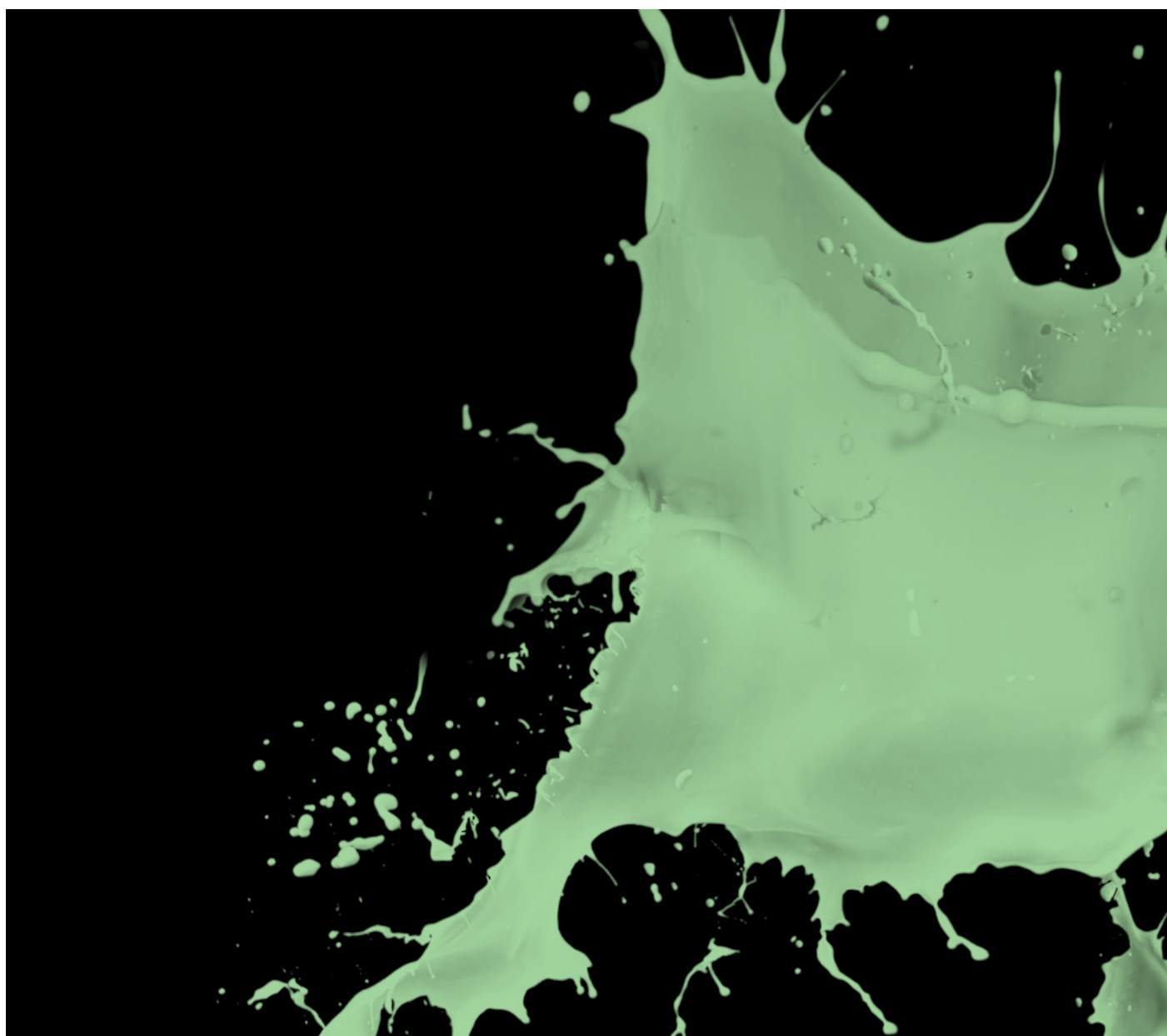




Degradation reference materials 2017

N-oxides



Welcome to LGCs degradation reference standards with focus on N-oxides.

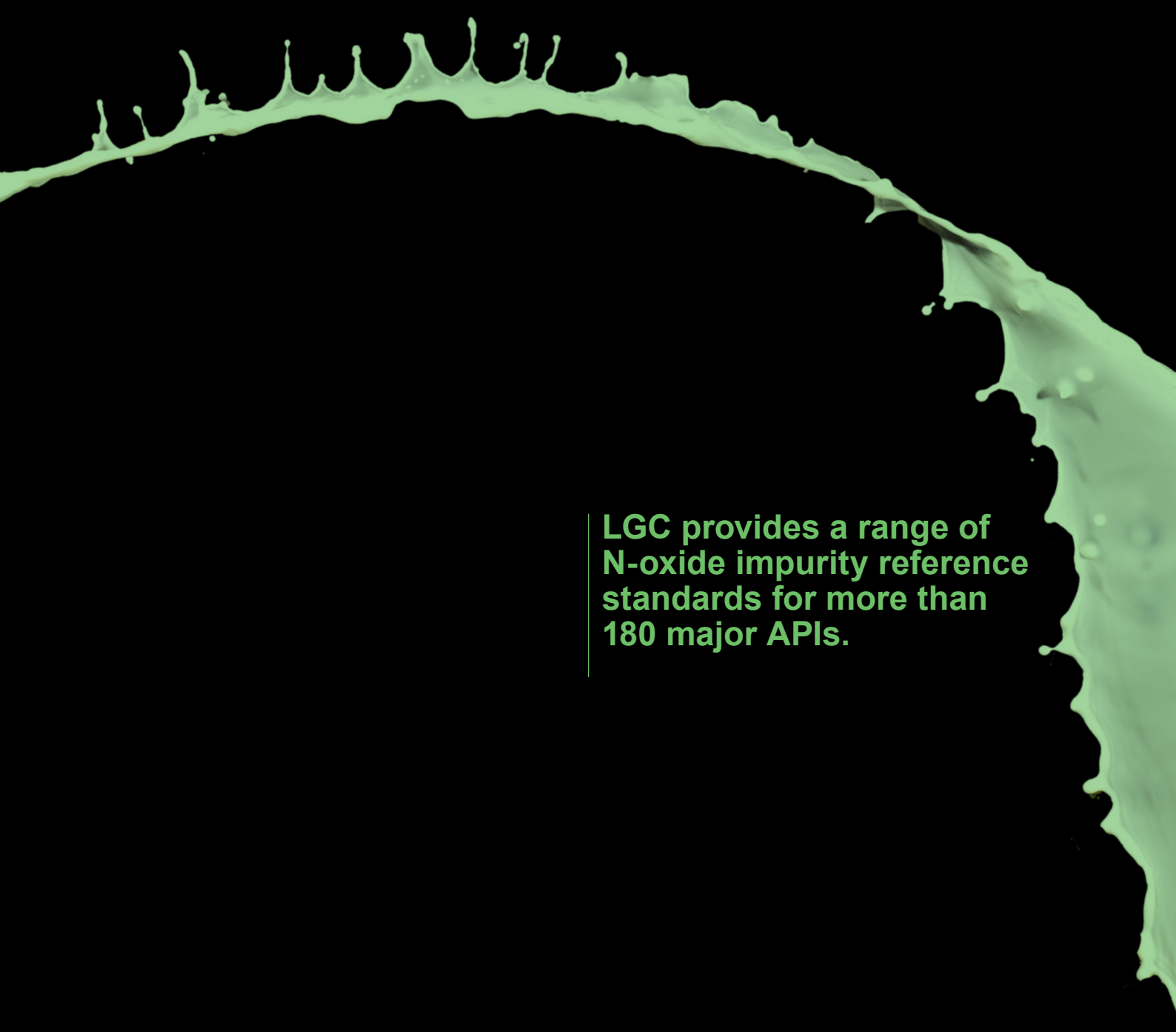
Active pharmaceutical ingredients (APIs) containing nitrogen as an amine are prone to degrade to N-Oxides readily and quickly under oxidative stress.

LGC's impurity reference standards are designed to be used at all relevant stages of the testing chain. The use of our N-Oxide impurities facilitate an assessment of the oxidative stress a particular product has been subjected to, the purity of the originating API, and help determine the shelf life of the product.

Each impurity is accompanied by a detailed certificate of analysis, providing all the information you need to best use the reference material. Our products can be used with confidence during analytical research and development and validation studies as well as for stability monitoring and routine quality control purposes.

Visit our webshop lgcstandards.com

To find out more contact your local [LGC office](#).



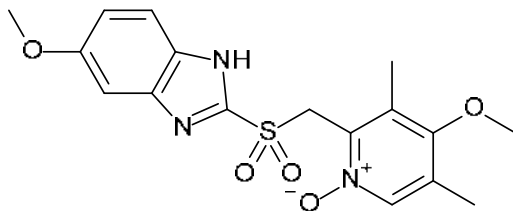
LGC provides a range of N-oxide impurity reference standards for more than 180 major APIs.



Certificate of Analysis

Reference Standard

4-Methoxy-2-[[[(5-methoxy-1H-benzimidazol-2-yl)sulphonyl]methyl]-3,5-dimethylpyridine 1-Oxide (Omeprazole Sulphone N-Oxide)



Molecular Formula: $C_{17}H_{19}N_3O_5S$
Molecular Weight: 377.42
CAS Number: 158812-85-2

Catalogue Number: MM0095.16
Lot Number: 119760
Long-term Storage: 2 to 8 °C, dark
Appearance: white solid
Melting Point: 185 °C (dec.)
Assay 'as is': 99.6 %

Date of shipment: **2017-June-30**

This certificate is valid for two years from the date of shipment provided the substance is stored under the recommended conditions unopened in the original container.

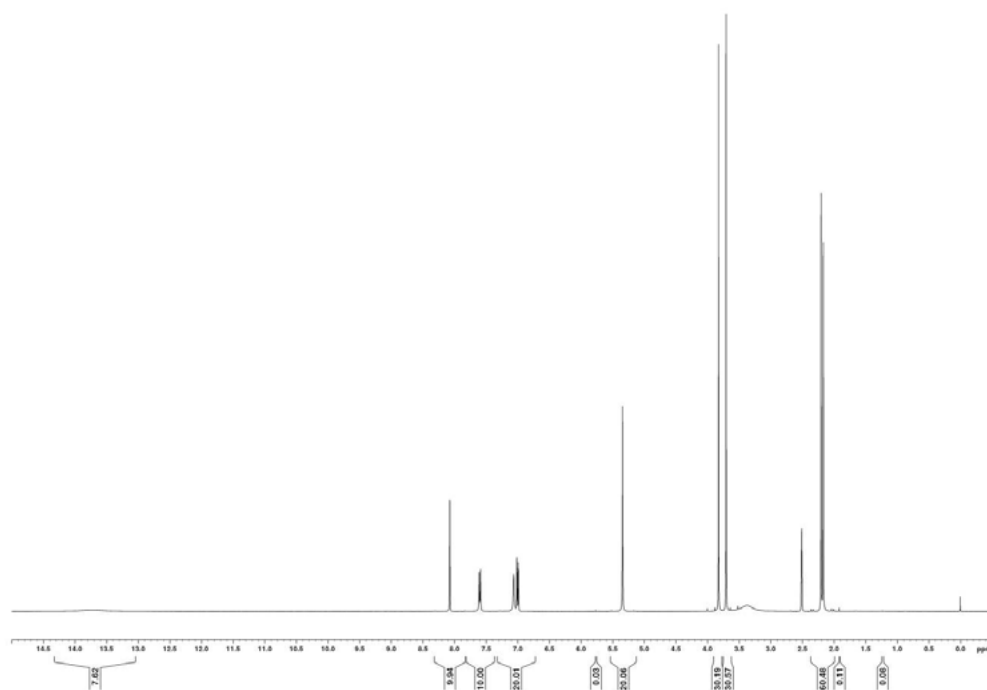


I. Identity

The identity of the reference substance was established by following analyses.

Ia. ^1H -NMR Spectrum

Conditions: 400 MHz, DMSO- d_6

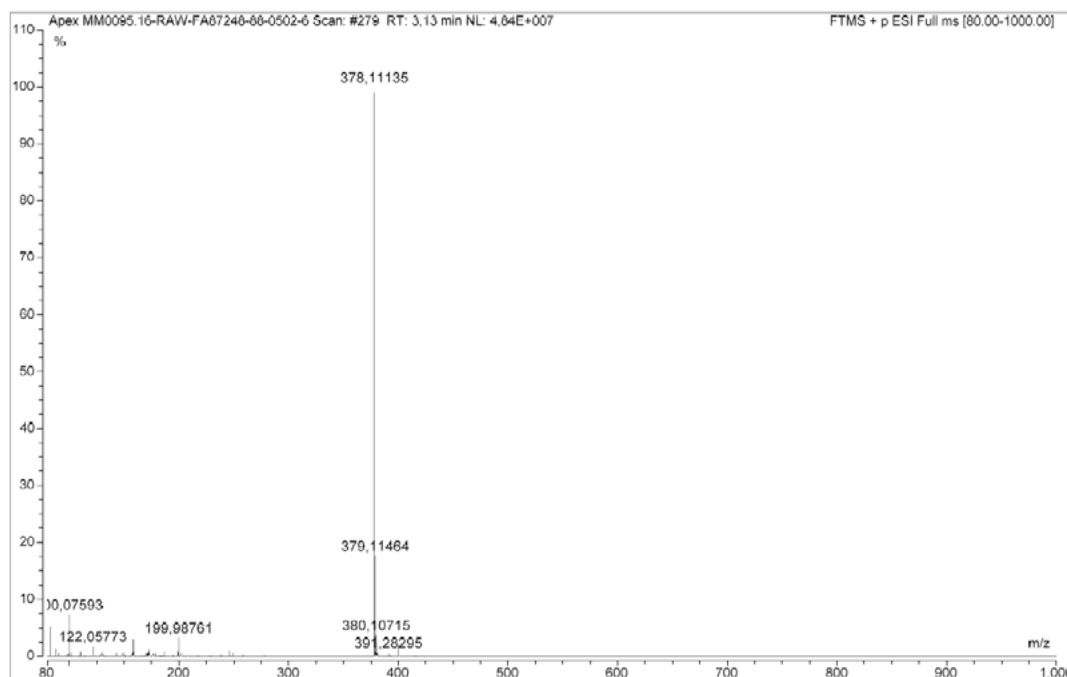


The structure is confirmed by the signals of the spectrum and their interpretation.



Ib. Mass Spectrum

Method: 3.5 kV ESI+; capillary temperature: 269 °C



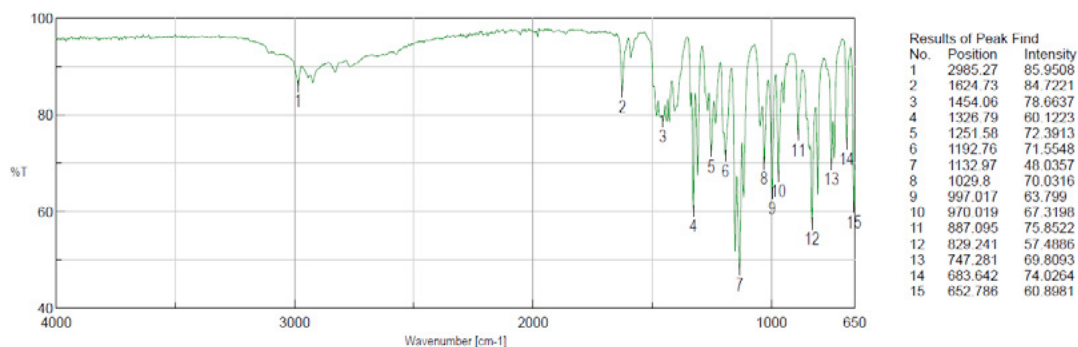
Theoretical value: 378.11182

The signal of the MS spectrum is consistent with the theoretical value and its interpretation is consistent with the structural formula.



Ic. IR Spectrum

Method: Attenuated Total Reflection Fourier Transform Infrared (ATR-FTIR) Spectroscopy



The signals of the IR spectrum and their interpretation are consistent with the structural formula.

II. Purity

Ila. High Performance Liquid Chromatography (HPLC)

The purity of the reference substance was analysed by high performance liquid chromatography (HPLC).

HPLC Conditions:

Column:

Hypersil Gold C18
5 μ m, 150 x 4.6 mm

Conditions:

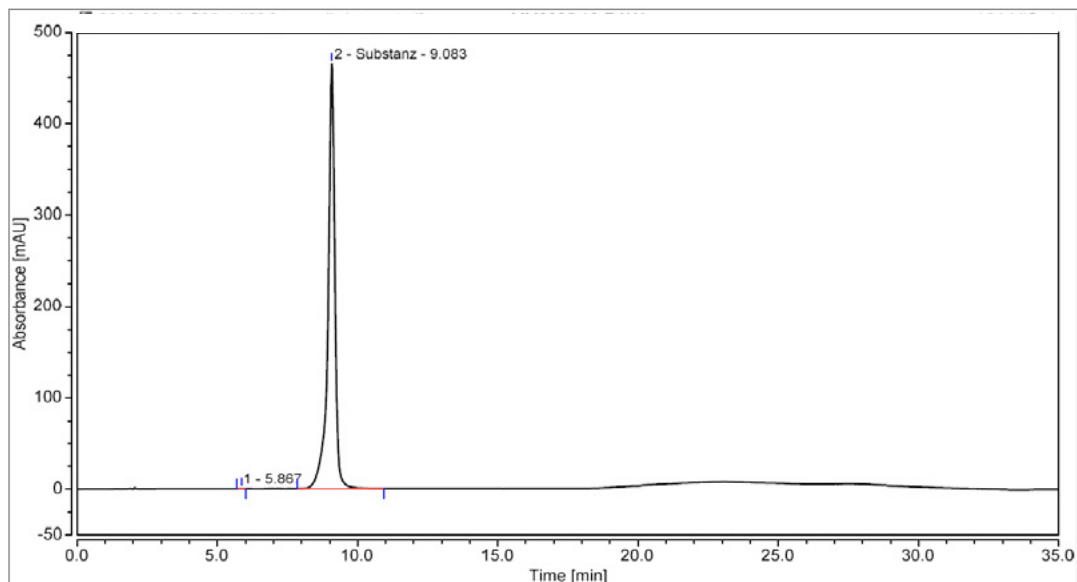
1.0 ml/min, 40 °C
0-15 min Water/Acetonitrile 80/20
15-20 min Water/Acetonitrile to 60/40
20-25 min Water/Acetonitrile 60/40
25-30 min Water/Acetonitrile to 80/20
30-35 min Water/Acetonitrile 80/20 (v/v);
0.1 % H₃PO₄

Detector:

DAD
220 nm

Injector:

Auto
5 μ l; 0.0696 mg/ml in
Water/Acetonitrile 50/50 (v/v)



Area Percent Report - Sorted by Signal

Pk #	Retention Time	Area	Area %
1	5.867	0.042	0.03
2	9.083	132.108	99.97
Totals		132.149	100.00

For the calculation the system peaks were ignored. The content of the analyte was determined as ratio of the peak area of the analyte and the cumulative areas of the purities, added up to 100 %.

Results:

Average	99.97 %
Number of results	n=3
Standard deviation	< 0.01 %

IIb. Water Content

Method: Karl Fischer titration

Results:

Average	0.22 %
Number of results	n=3
Standard deviation	0.01 %



IIc. Residual Solvents

Method: ¹H-NMR

Result: 0.06 % Acetic acid
0.03 % Dichloromethane
0.02 % *n*-Hexane

III. Final Result

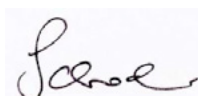
Chromatographic purity (HPLC)	99.97 %
Water content	0.22 %
Residual solvents	0.11 %
Assay (100 % method) ¹	99.64 %

The assay is assessed to be 99.6 % 'as is'

The assay 'as is' is equivalent to the assay based on the not anhydrous and not dried substance respectively.

Release Date:

Luckenwalde, 2016-12-13



Dr. Sabine Schröder
Product Release

¹ The calculation of the 100 % method follows the formula:

$$\text{Assay (\%)} = (100 \% - \text{volatile contents}) * \frac{\text{Purity (\%)}}{100 \%}$$

Volatile contents are considered as absolute contributions, purity is considered as relative contribution.

A–Z of products

N-oxides

A.

Amiodarone Hydrochloride —
Azaperone

B.

Bamifylline Hydrochloride —
Butorphanol Tartrate

C.

Carbinoxamine Maleate —
Cyproheptadine Hydrochloride

D.

Deanol Acetamidobenzoate —
Droperidol

E.

Ebastine — Escitalopram Oxalate

F.

Fentanyl — Furaltadone

G.

Gefitinib — Granisetron Hydrochloride

H.

Halofantrine Hydrochloride —
Hyoscyamine Sulfate

I.

Imipramine Hydrochloride

K.

Ketoconazole —
Ketotifen Hydrogen Fumarate

L.

Lansoprazole — Loxapine Succinate

M.

Mebhydrolin Napadisilate —
Mycophenolate Mofeti

N.

Nalbuphine Hydrochloride — Nikethamide

O.

Ofloxacin — Oxycodone Hydrochloride

P.

Pantoprazole Sodium Sesquihydrate —
Proxymetacaine Hydrochloride

Q.

Quetiapine Fumarate —
Quinine Hydrochloride

R.

Rabeprazole Sodium —
Rotigotine Hydrochloride

S.

Sildenafil Citrate —
Sumatriptan Succinate

T.

Tamoxifen Citrate — Tropicamide

V.

Vardenafil Hydrochloride Trihydrate —
Vinpocetine

X.

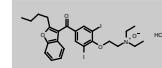
Xanthinol Nicotinate

Z.

Zolmitriptan — Zopiclone

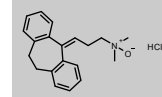
Amiodarone Hydrochloride

[MM0697.10](#) Amiodarone N-Oxide Hydrochloride n/a 100mg



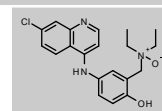
Amitriptyline Hydrochloride

[MM0062.12](#) Amitriptyline N-Oxide Hydrochloride 4290-60-2 10mg



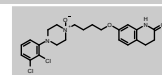
Amodiaquine Dihydrochloride Dihydrate

[MM0617.08](#) Amodiaquine N-Oxide 102391-07-1 100mg



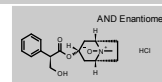
Aripiprazole

[MM0961.03](#) **Imp. F** (EP): 7-[4-[4-(2,3-Dichlorophenyl)-1-oxidopiperazin-1-yl]butoxy]-3,4-dihydroquinolin-2(1H)-one (Aripiprazole N-Oxide) 573691-09-5 100mg



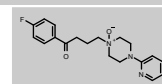
Atropine

[MM0289.19](#) Atropine N-Oxide Hydrochloride 4574-60-1 100mg



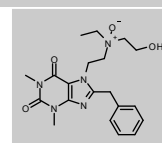
Azaperone

[MM1164.01](#) Azaperone N-Oxide 66065-28-9 100mg



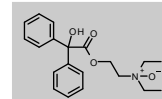
Bamifylline Hydrochloride

[MM1823.01](#) Bamifylline N-Oxide n/a 100mg



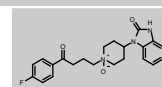
Benactyzine Hydrochloride

[MM1826.02](#) Benactyzine N-Oxide 42771-70-0 100mg



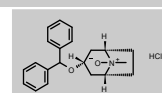
Benperidol

[MM0113.09](#) **Mixture of Imp. D and E** (EP): Benperidol N-Oxide (cis and trans) 118435-01-1 25mg



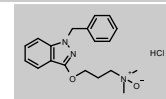
Benztropine Mesilate

[MM1227.02](#) Benztropine N-Oxide Hydrochloride n/a 100mg



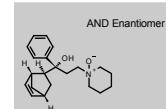
Benzylamine Hydrochloride

[MM0142.08](#) Benzylamine N-Oxide Hydrochloride 39860-94-1 100mg

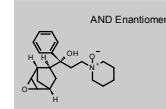


Biperiden Hydrochloride

[MM0288.07](#) Biperiden N-Oxide n/a 100mg

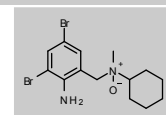


[MM0288.08](#) Biperiden Epoxide N-Oxide n/a 100mg



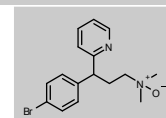
Bromhexine Hydrochloride

[MM0065.09](#) Bromhexine N-Oxide n/a 100mg



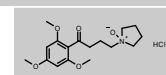
Brompheniramine Maleate

[MM0060.12](#) Brompheniramine N-Oxide 18453-29-7 100mg



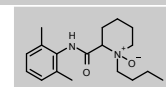
Buflomedil Hydrochloride

[MM0066.12](#) Buflomedil N-Oxide Hydrochloride n/a 100mg



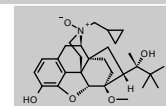
Bupivacaine Hydrochloride

[MM0613.07](#) Bupivacaine N-Oxide n/a 100mg



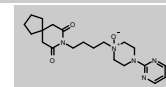
Buprenorphine

[MM0120.15](#) Buprenorphine N-Oxide 112242-17-8 100mg



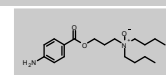
Buspirone Hydrochloride

[MM0464.18](#) Buspirone N-Oxide 220747-81-9 100mg



Butacaine Sulfate

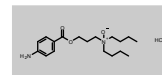
[MM1638.01](#) Butacaine N-Oxide n/a 100mg



[MM1638.02](#) Butacaine N-Oxide Hydrochloride

n/a

100mg

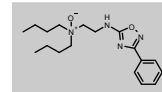


Butalamine Hydrochloride

[MM1845.02](#) Butalamine N-Oxide

n/a

100mg

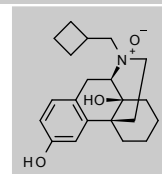


Butorphanol Tartrate

[MM1192.01](#) Butorphanol N-Oxide

112269-63-3

100mg

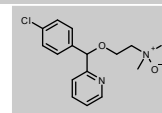


Carbinoxamine Maleate

[MM1135.01](#) Carbinoxamine N-Oxide

1256285-70-7

100mg

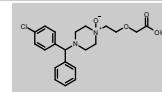


Cetirizine Dihydrochloride

[MM0380.13](#) Cetirizine N-Oxide

1076199-80-8

100mg

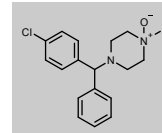


Chlorcyclizine Hydrochloride

[MM1653.01](#) Chlorcyclizine N-Oxide

10457-56-4

100mg

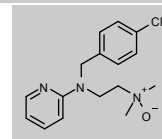


Chlorpyramine Hydrochloride

[MM1894.02](#) Chlorpyramine N-Oxide

n/a

100mg

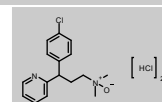


Chlorphenamine Maleate

[MM0090.11](#) Chlorphenamine N-Oxide Dihydrochloride

n/a

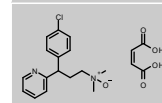
100mg



[MM0090.15](#) Chlorphenamine N-Oxide Maleate

n/a

100mg

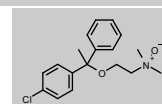


Chlorphenoxamine Hydrochloride

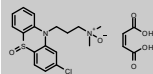
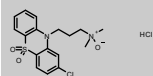
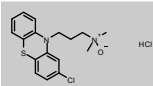
[MM1291.02](#) Chlorphenoxamine N-Oxide

110203-91-3

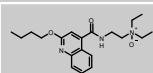
100mg



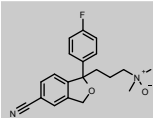
Chlorpromazine Hydrochloride

MM0420.02	Chlorpromazine Sulphoxide N-Oxide Maleate	150111-59-4	10mg	
MM0420.11	Chlorpromazine Sulfone N-Oxide Hydrochloride (Chlorpromazine N,S,S-Trioxide Hydrochloride)	109724-46-1	100mg	
MM0420.13	Chlorpromazine N-Oxide Hydrochloride	n/a	100mg	

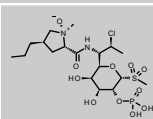
Cinchocaine Hydrochloride

MM0604.05	Cinchocaine N-Oxide	87864-07-1	100mg	
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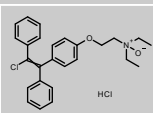
Citalopram Hydrobromide

MM0242.10	Citalopram N-Oxide	63284-72-0	100mg	
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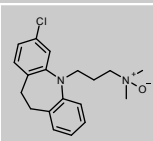
Clindamycin Phosphate

MM1520.05	Clindamycin Phosphate Sulfone trans-N-Oxide	n/a	100mg	
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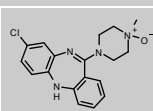
Clomifene Citrate

MM0650.01	Clomifene N-Oxide Hydrochloride	97986-33-9	100mg	
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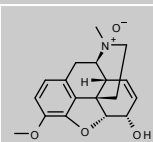
Clomipramine Hydrochloride

MM0545.09	Clomipramine N-Oxide	14171-67-6	100mg	
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Clozapine

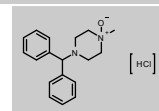
MM0480.07	Clozapine N-Oxide	34233-69-7	100mg	
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Codeine

MM0004.01	Codeine N-Oxide	3688-65-1	CS 250mg	
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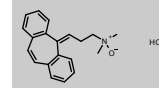
Cyclizine Hydrochloride

[MM1265.04](#) Cyclizine N-Oxide Dihydrochloride n/a 100mg



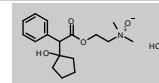
Cyclobenzaprine Hydrochloride

[MM1248.03](#) Cyclobenzaprine N-Oxide Hydrochloride n/a 100mg



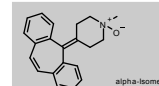
Cyclopentolate Hydrochloride

[MM0580.05](#) Cyclopentolate N-Oxide Hydrochloride n/a 100mg

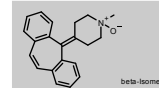


Cyproheptadine Hydrochloride

[MM0609.05](#) Cyproheptadine α -N-Oxide 54381-42-9 100mg

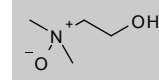


[MM0609.06](#) Cyproheptadine β -N-Oxide 60251-34-5 100mg



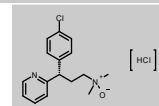
Deanol Acetamidobenzoate

[MM1681.01](#) Deanol N-Oxide 10489-99-3 100mg



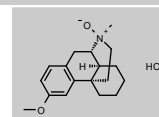
Dexchlorpheniramine Maleate

[MM1114.03](#) Dexchlorpheniramine N-Oxide Dihydrochloride n/a 100mg



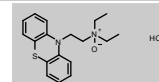
Dextromethorphan Hydrobromide

[MM0033.11](#) Dextromethorphan N-Oxide Hydrochloride 1177419-85-0 100mg

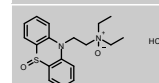


Diethazine Hydrochloride

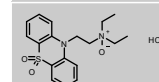
[MM1593.08](#) Diethazine N-Oxide Hydrochloride n/a 100mg



[MM1593.09](#) Diethazine Sulfoxide N-Oxide Hydrochloride (Diethazine N,S-Dioxide Hydrochloride) n/a 100mg



[MM1593.10](#) Diethazine Sulfone N-Oxide Hydrochloride (Diethazine N,S,S-Trioxide Hydrochloride) n/a 100mg



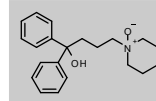
Difenidol Hydrochloride

[MM3053.01](#)

Difenidol N-Oxide

40220-79-9

100mg



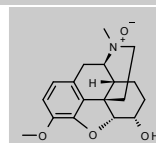
Dihydrocodeine Hydrogen Tartrate

[MM0812.08](#)

Dihydrocodeine N-Oxide

109667-32-5

100mg



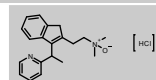
Dimetindene Maleate

[MM0595.13](#)

Dimetindene N-Oxide Dihydrochloride

n/a

100mg



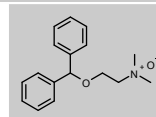
Diphenhydramine Hydrochloride

[MM0490.01](#)

Diphenhydramine N-Oxide

3922-74-5

100mg



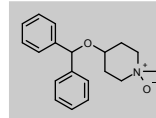
Diphenylpyraline Hydrochloride

[MM0557.04](#)

Diphenylpyraline N-Oxide

10020-59-4

100mg



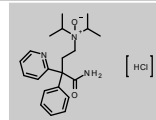
Disopyramide

[MM0108.09](#)

Disopyramide N-Oxide Dihydrochloride

n/a

100mg



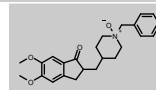
Donepezil Hydrochloride

[MM0677.14](#)

Donepezil N-Oxide

120013-84-5

50mg



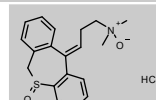
Dosulepin Hydrochloride

[MM0510.13](#)

Dosulepin Sulfoxide N-Oxide Hydrochloride (Dosulepin N,S-Dioxide Hydrochloride)

n/a

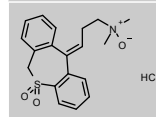
100mg


[MM0510.14](#)

Dosulepin Sulfone N-Oxide Hydrochloride (Dosulepin N,S,S-Trioxide Hydrochloride)

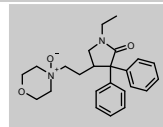
n/a

100mg



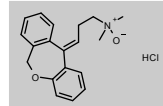
Doxapram Hydrochloride

[MM0525.03](#) Doxapram N-Oxide n/a 100mg



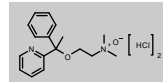
Doxepin Hydrochloride

[MM0032.12](#) Doxepin N-Oxide Hydrochloride n/a 100mg



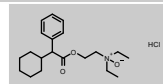
Doxylamine Hydrogen Succinate

[MM0101.05](#) Doxylamine N-Oxide Dihydrochloride n/a 100mg



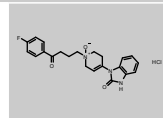
Drofenine Hydrochloride

[MM0768.01](#) Drofenine N-Oxide Hydrochloride n/a 100mg



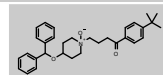
Droperidol

[MM0138.04](#) **Imp. D (EP) as Hydrochloride:** (1*RS*)-1-[4-(4-Fluorophenyl)-4-oxobutyl]-4-(2-oxo-2,3-dihydro-1*H*-benzimidazol-1-yl)-1,2,3,6-tetrahydropyridine 1-Oxide Hydrochloride n/a 100mg



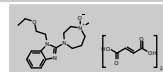
Ebastine

[MM0468.09](#) **Mixture of Imp. F and G (EP):** Ebastine N-Oxide (cis and trans) 1256285-71-8 50mg



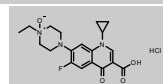
Emedastine Difumarate

[MM1277.09](#) Emedastine N-Oxide Difumarate n/a 100mg



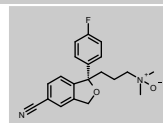
Enrofloxacin

[MM0395.07](#) Enrofloxacin N-Oxide Hydrochloride n/a 100mg

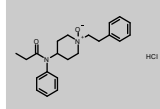


Escitalopram Oxalate

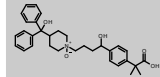
[MM1162.05](#) Escitalopram N-Oxide 917482-45-2 100mg



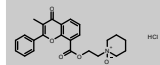
Fentanyl

MM0528.09	Imp. A (EP) as Hydrochloride: N-Phenyl-N-[cis,trans-1-oxido-1-(2-phenylethyl)piperidin-4-yl]propanamide Hydrochloride (Fentanyl N-Oxide Hydrochloride)	n/a	100mg	
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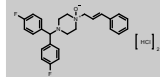
Fexofenadine Hydrochloride

MM0507.10	Fexofenadine N-Oxide	1422515-52-3	25mg	
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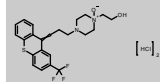
Flavoxate Hydrochloride

MM0156.07	Flavoxate N-Oxide Hydrochloride	n/a	100mg	
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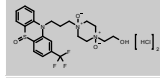
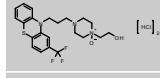
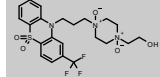
Flunarizine Dihydrochloride

MM0175.06	Flunarizine N-Oxide Dihydrochloride	n/a	100mg	
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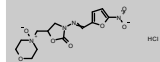
Flupentixol Dihydrochloride

MM0223.14	Flupentixol N1-Oxide Dihydrochloride	n/a	50mg	
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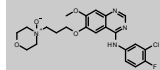
Fluphenazine Dihydrochloride

MM0114.04	Fluphenazine N,N',S-Trioxide Dihydrochloride	n/a	100mg	
MM0114.15	Fluphenazine N1-Oxide Dihydrochloride	n/a	100mg	
MM0114.18	Fluphenazine Sulfone N1,N4-Dioxide (Fluphenazine N1,N4,S,S-Tetraoxide)	86137-45-3	100mg	

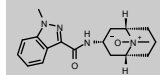
Furaltadone

MM1753.02	Furaltadone N-Oxide Hydrochloride	n/a	100mg	
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Gefitinib

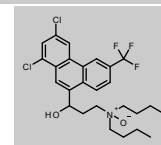
MM3563.01	Gefitinib N-Oxide	847949-51-3	100mg	
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Granisetron Hydrochloride

MM0398.11	Granisetron N-Oxide	160177-68-4	50mg	
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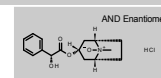
Halofantrine Hydrochloride

[MM0433.05](#) Halofantrine N-Oxide 1348409-88-0 100mg



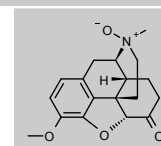
Homatropine Hydrobromide

[MM1649.02](#) Homatropine N-Oxide Hydrochloride n/a 100mg



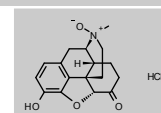
Hydrocodone Hydrogen Tartrate 2.5-Hydrate

[MM1113.17](#) Hydrocodone N-Oxide 909265-05-0 100mg



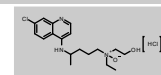
Hydromorphone Hydrochloride

[MM0371.09](#) Imp. B (EP) as Hydrochloride: 4,5α-Epoxy-3-hydroxy-17-methylmorphinan-6-one 17-Oxide Hydrochloride (Hydromorphone N-Oxide Hydrochloride) n/a 100mg



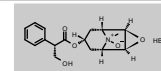
Hydroxychloroquine Sulphate

[MM0764.05](#) Hydroxychloroquine N-Oxide Dihydrochloride n/a 10mg



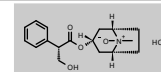
Hyoscine Hydrobromide

[MM0546.07](#) Hyoscine N-Oxide Hydrobromide 6106-81-6 100mg



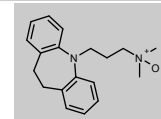
Hyoscyamine Sulfate

[MM0794.09](#) Hyoscyamine N-Oxide Hydrochloride 200721-88-6 100mg



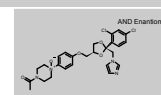
Imipramine Hydrochloride

[MM0077.12](#) Imipramine N-Oxide 6829-98-7 100mg



Ketoconazole

[MM0145.07](#) Ketoconazole N-Oxide 254912-65-7 100mg



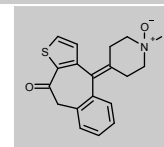
Ketotifen Hydrogen Fumarate

[MM0180.07](#)

Imp. D (EP): 4-[(aRaS)-1-Methylpiperidin-4-ylidene]-4,9-dihydro-10H-benzo[4,5]cyclohepta[1,2-b]thiophen-10-one N-Oxide (Ketotifen N-Oxide)

88456-70-6

100mg



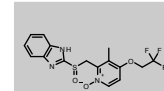
Lansoprazole

[MM0474.07](#)

Imp. A (EP): 2-[(RS)-[[3-Methyl-1-oxido-4-(2,2,2-trifluoroethoxy)pyridin-2-yl]methyl]sulphonyl]-1H-benzimidazole (Lansoprazole N-Oxide)

213476-12-1

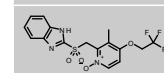
100mg


[MM0474.08](#)

Lansoprazole Sulphone N-Oxide

953787-54-7

100mg



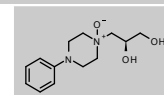
Levodropropizine

[MM1246.05](#)

Levodropropizine N-Oxide

152237-40-6

100mg



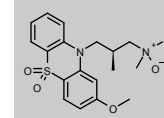
Levomepromazine Maleate

[MM0019.11](#)

Levomepromazine Sulfone N-Oxide (Levomepromazine N,S,S-Trioxide)

n/a

50mg



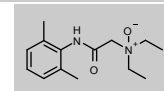
Lidocaine Hydrochloride

[MM0102.01](#)

Imp. B (EP): 2-(Diethylazirinoyl)-N-(2,6-dimethylphenyl)acetamide (Lidocaine N²-Oxide)

2903-45-9

100mg



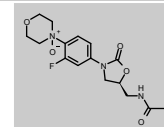
Linezolid

[MM3300.04](#)

Linezolid N-Oxide

189038-36-6

100mg



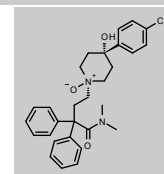
Loperamide Hydrochloride

[MM0025.09](#)

Imp. F (EP): Loperamide Oxide

106900-12-3

100mg



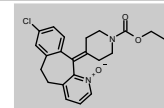
Loratadine

[MM0257.21](#)

Loratadine N-Oxide

165739-62-8

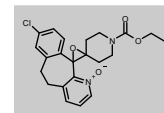
100mg



[MM0257.22](#) Loratadine Epoxide N-Oxide

1432057-93-6

100mg

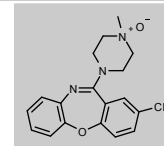


Loxapine Succinate

[MM1530.04](#) Loxapine N-Oxide

25967-34-4

100mg

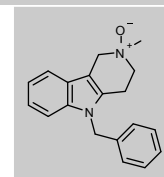


Mebhydrolin Napadisilate

[MM1891.01](#) Mebhydrolin N-Oxide

210408-26-7

100mg

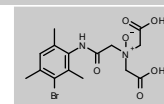


Mebrofenin

[MM3594.01](#) Mebrofenin N-Oxide

n/a

50mg

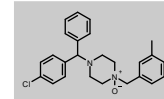


Meclozine Hydrochloride

[MM0586.05](#) Meclozine N-Oxide

114624-69-0

10mg

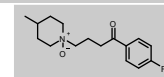


Melperone

[MM0321.01](#) Melperone N-Oxide

n/a

100mg

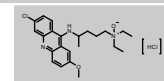


Mepacrine Hydrochloride

[MM1695.02](#) Mepacrine N-Oxide Dihydrochloride

n/a

100mg

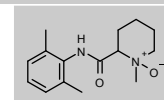


Mepivacaine Hydrochloride

[MM0368.06](#) Mepivacaine N-Oxide

n/a

100mg

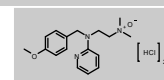


Mepyramine Maleate

[MM0559.05](#) Mepyramine N-Oxide Dihydrochloride

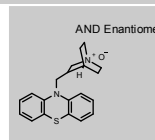
n/a

100mg



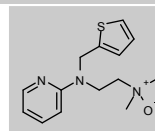
Mequitazine

[MM3131.01](#) Mequitazine N-Oxide n/a 100mg



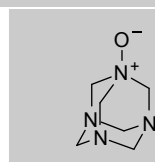
Methapyrilene Hydrochloride

[MM1680.01](#) Methapyrilene N-Oxide 78761-79-2 100mg



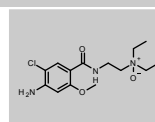
Methenamine

[MM1998.01](#) Methenamine N-Oxide 62190-92-5 100mg



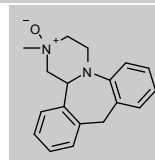
Metoclopramide

[MM0073.07](#) **Imp. G** (EP): N'-(4-Amino-5-chloro-2-methoxybenzoyl)-N,N-diethylethane-1,2-diamine N-Oxide (Metoclopramide N-Oxide) 171367-22-9 100mg



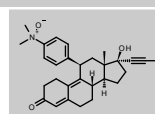
Mianserin Hydrochloride

[MM0147.06](#) Mianserin N-Oxide 62510-46-7 100mg



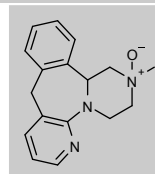
Mifepristone

[MM1007.02](#) Mifepristone N-Oxide 91934-98-4 100mg



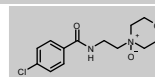
Mirtazapine

[MM1005.02](#) **Imp. A** (EP): (14b*RS*)-2-Methyl-1,2,3,4,10-14b-hexahydropyrazino[2,1-a]pyrido[2,3-c][2]benzazepine 2-Oxide 155172-12-6 100mg



Moclobemide

[MM0250.03](#) Moclobemide N-Oxide 64544-24-7 100mg

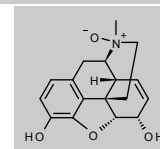


Morphine Hydrochloride

[MM0037.03](#)

Imp. F (EP): (17S)-7,8-Didehydro-4,5 α -epoxy-17-methylmorphinan-3,6 α -diol 17-Oxide (Morphine N-Oxide)

639-46-3

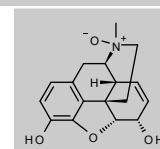
CS 100mg


Morphine Sulphate

[MM0037.03](#)

Imp. F (EP): (17S)-7,8-Didehydro-4,5 α -epoxy-17-methylmorphinan-3,6 α -diol 17-Oxide (Morphine N-Oxide)

639-46-3

CS 100mg


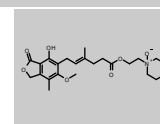
Mycophenolate Mofetil

[MM1001.07](#)

Imp. G (EP): 2-(Morpholin-4-yl)ethyl (4E)-6-(4-Hydroxy-6-methoxy-7-methyl-3-oxo-1,3-dihydroisobenzofuran-5-yl)-4-methylhex-4-enoate N-Oxide

224052-51-1

100mg



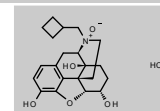
Nalbuphine Hydrochloride

[MM0341.02](#)

Nalbuphine N-Oxide Hydrochloride

n/a

100mg



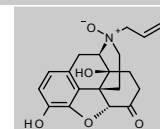
Naloxone Hydrochloride Dihydrate

[MM0272.03](#)

Naloxone N-Oxide

112242-14-5

100mg



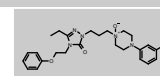
Nefazodone Hydrochloride

[MM0591.02](#)

Nefazodone N-Oxide

n/a

100mg



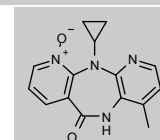
Nevirapine Anhydrous

[MM1146.06](#)

Nevirapine N10-Oxide

1027324-99-7

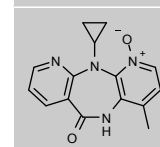
50mg


[MM1146.07](#)

Nevirapine N1-Oxide

162255-73-4

100mg



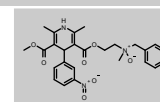
Nicardipine Hydrochloride

[MM0465.04](#)

Nicardipine N-Oxide

n/a

100mg



Nicotine

MM0517.07	Imp. E (EP): (1RS,2S)-1-Methyl-2-(pyridin-3-yl)pyrrolidine 1-Oxide (Nicotine N'-Oxide)	491-26-9	100mg	
MM0517.08	3-[(1S,2S)-1-Methyl-1-oxidopyrrolidin-2-yl]pyridine (Nicotine cis-N'-Oxide)	51095-86-4	50mg	
MM0517.19	(1RS,2S)-Nicotine N,N'-Dioxide (3-[(1RS,2S)-1-Methyl-1-oxidopyrrolidin-2-yl]pyridine 1-Oxide)	2055-29-0	100mg	

Nikethamide

MM0627.02	Nikethamide N-Oxide Hydrochloride	n/a	100mg	
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Ofloxacin

MM0228.10	Imp. F (EP) as Hydrochloride: 4-[(RS)-6-Carboxy-9-fluoro-3-methyl-7-oxo-2,3-dihydro-7H-pyrido[1,2,3-de]-1,4-benzoxazine-10-yl]-1-methylpiperazine 1-Oxide Hydrochloride (Ofloxacin N-Oxide Hydrochloride)	n/a	100mg	
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Olanzapine

MM0329.03	Imp. D (EP): 1-Methyl-4-(2-methyl-10H-thieno[2,3-b][1,5]benzodiazepin-4-yl)piperazin-1-oxide (Olanzapine N-Oxide)	174794-02-6	50mg	
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Olopatadine Hydrochloride

MM1261.09	(Z)-3-[2-(Carboxymethyl)dibenzo[b,e]oxepin-11(6H)-ylidene]-N,N-dimethylpropan-1-amine Oxide Hydrochloride (Olopatadine N-Oxide Hydrochloride)	n/a	100mg	
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Omeprazole

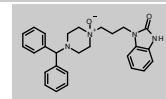
MM0095.07	Imp. E (EP): 4-Methoxy-2-[[[(RS)-(5-methoxy-1H-benzimidazol-2-yl)sulphonyl]methyl]-3,5-dimethylpyridine 1-Oxide (Omeprazole N-Oxide)	176219-04-8	100mg	
MM0095.16	Imp. I (EP): 4-Methoxy-2-[[[(5-methoxy-1H-benzimidazol-2-yl)sulphonyl]methyl]-3,5-dimethylpyridine 1-Oxide (Omeprazole Sulphone N-Oxide)	158812-85-2	100mg	

Opipramol Dihydrochloride

MM0422.03	Opipramol N-Oxide	n/a	100mg	
MM0422.08	Opipramol Di-N-Oxide	n/a	50mg	

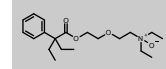
Oxatomide

[MM1115.01](#) Oxatomide N-Oxide n/a 100mg



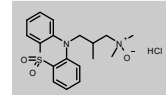
Oxeladin Hydrogen Citrate

[MM0547.01](#) Oxeladin N-Oxide n/a 10mg



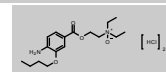
Oxomemazine

[MM0958.04](#) Oxomemazine N-Oxide Hydrochloride (Trimeprazine Sulphone N-Oxide Hydrochloride) n/a 100mg



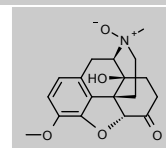
Oxybuprocaine Hydrochloride

[MM0543.05](#) Oxybuprocaine N-Oxide Dihydrochloride n/a 100mg



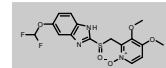
Oxycodone Hydrochloride

[MM0672.06](#) Oxycodone N-Oxide 71539-52-1 50mg

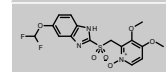


Pantoprazole Sodium Sesquihydrate

[MM0099.06](#) Pantoprazole N-Oxide 953787-60-5 100mg

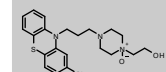


[MM0099.07](#) Pantoprazole Sulphone N-Oxide 953787-55-8 100mg

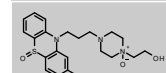


Perphenazine

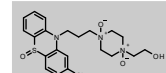
[MM0826.03](#) Perphenazine N1-Oxide 803615-00-1 100mg



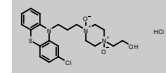
[MM0826.05](#) Perphenazine Sulfoxide N1-Oxide (Perphenazine N1,S-Dioxide) n/a 100mg



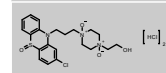
[MM0826.08](#) Perphenazine Sulfoxide N1,N4-Dioxide (Perphenazine N1,N4,S-Trioxide) n/a 100mg



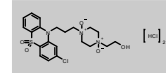
[MM0826.09](#) Perphenazine N1,N4-Dioxide Monohydrochloride n/a 100mg



[MM0826.10](#) Perphenazine Sulfoxide N1,N4-Dioxide Dihydrochloride (Perphenazine N1,N4,S-Trioxide Dihydrochloride) n/a 100mg

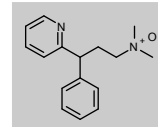


[MM0826.11](#) Perphenazine Sulfone N1,N4-Dioxide Dihydrochloride (Perphenazine N1,N4,S,S-Tetraoxide Dihydrochloride) n/a 100mg



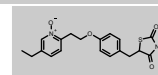
Pheniramine Maleate

[MM0059.04](#) Pheniramine N-Oxide 12656-98-3 100mg



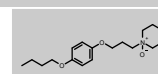
Pioglitazone Hydrochloride

[MM0616.09](#) Pioglitazone N-Oxide 145350-09-0 100mg



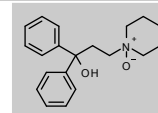
Pramoxine Hydrochloride

[MM3228.01](#) Pramoxine N-Oxide n/a 100mg



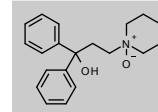
Pridinol Hydrochloride

[MM3493.02](#) Pridinol N-Oxide n/a 100mg



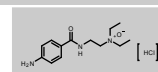
Pridinol Mesilate

[MM3493.02](#) Pridinol N-Oxide n/a 100mg



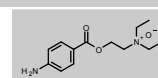
Procainamide Hydrochloride

[MM0550.02](#) Procainamide N-Oxide Dihydrochloride n/a 100mg



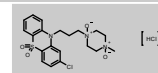
Procaine Hydrochloride

[MM0596.02](#) Procaine N-Oxide 1027072-50-9 100mg



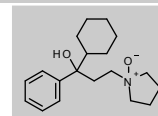
Prochlorperazine Maleate

[MM0411.13](#) Prochlorperazine Sulfone N1,N4-Dioxide Dihydrochloride (Prochlorperazine N1,N4,S,S-Tetraoxide Dihydrochloride) n/a 50mg



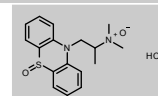
Procyclidine Hydrochloride

[MM1573.01](#) Procyclidine N-Oxide n/a 100mg



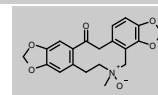
Promethazine Hydrochloride

[MM0412.05](#) Promethazine Sulphoxide N-Oxide Hydrochloride 1135334-50-7 100mg



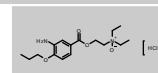
Protopine

[MM2571.01](#) Protopine N-Oxide 87264-51-5 100mg



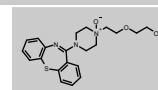
Proxymetacaine Hydrochloride

[MM0404.02](#) Proxymetacaine N-Oxide Dihydrochloride n/a 50mg



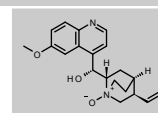
Quetiapine Fumarate

[MM1130.10](#) **Imp. H** (EP): 2-[2-[4-(Dibenzo[b,f][1,4]thiazepin-11-yl)-1-oxidopiperazin-1-yl]ethoxy]ethanol (Quetiapine N-Oxide) 1076199-40-0 50mg

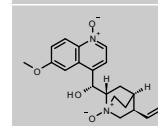


Quinine Dihydrochloride

[MM0458.01](#) Quinine N-Oxide 109906-48-1 100mg

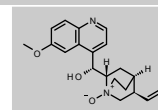


[MM0458.05](#) Quinine N,N'-Dioxide (Quinine Di-N-Oxide) 101655-92-9 50mg



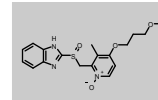
Quinine Hydrochloride

[MM0458.01](#) Quinine N-Oxide 109906-48-1 100mg

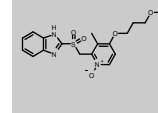


Rabeprazole Sodium

[MM0618.04](#) **Imp D** (EP): 2-[[[(RS)-(1H-Benzimidazol-2-yl)sulfinyl]methyl]-4-(3-methoxypropoxy)-3-methylpyridine 1-Oxide (Rabeprazole N-Oxide) 924663-38-7 100mg

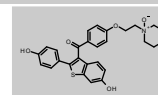


[MM0618.05](#) **Imp I** (EP): 2-[[[(1H-Benzimidazol-2-yl)sulfonyl]methyl]-4-(3-methoxypropoxy)-3-methylpyridine 1-Oxide (Rabeprazole Sulphone N-Oxide) 924663-37-6 100mg



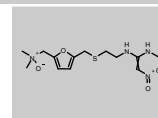
Raloxifene Hydrochloride

[MM0738.01](#) **Imp. C** (EP): [6-Hydroxy-2-(4-hydroxyphenyl)-1-benzothiophen-3-yl][4-[2-(piperidin-1-yl)ethoxy]phenyl]methanone N-Oxide (Raloxifene N-Oxide) 195454-31-0 50mg



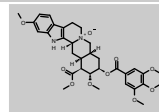
Ranitidine Hydrochloride

[MM0086.05](#) **Imp. E** (EP): N-[2-[[[5-[(Dimethyloxidoamino)-methyl]furan-2-yl]methyl]sulphonyl]ethyl]-N'-methyl-2-nitroethene-1,1-diamine (Ranitidine N-Oxide) 73857-20-2 100mg



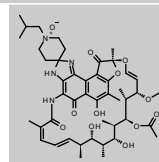
Reserpine

[MM1423.01](#) Reserpine N-Oxide 474-48-6 100mg



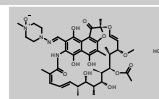
Rifabutin

[MM0633.06](#) Rifabutin N-Oxide 645406-37-7 100mg



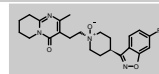
Rifampicin

[MM0514.05](#) **Imp. B** (EP) as Hydrochloride: Rifampicin N-Oxide Hydrochloride n/a 100mg

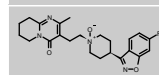


Risperidone

[MM0491.21](#) Risperidone cis-N-Oxide n/a 100mg

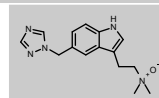


[MM0491.22](#) Risperidone trans-N-Oxide n/a 50mg



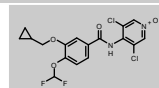
Rizatriptan Benzoate

[MM1313.08](#) **Imp. H** (EP): N,N-Dimethyl-2-[5-(1H-1,2,4-triazol-1-ylmethyl)-1H-indol-3-yl]ethanamine N-Oxide (Rizatriptan N-Oxide) 260435-42-5 100mg



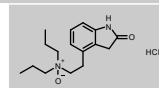
Roflumilast

[MM3618.05](#) Roflumilast N-Oxide 292135-78-5 50mg



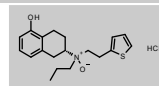
Ropinirole Hydrochloride

[MM0331.10](#) Ropinirole N-Oxide Hydrochloride n/a 100mg



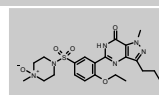
Rotigotine Hydrochloride

[MM1403.10](#) Rotigotine N-Oxide Hydrochloride n/a 50mg



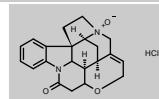
Sildenafil Citrate

[MM0254.04](#) **Imp. B** (EP): 5-[2-Ethoxy-5-[(4-methyl-4-oxidopiperazin-1-yl)sulfonyl]phenyl]-1-methyl-3-propyl-1,6-dihydro-7H-pyrazolo[4,3-d]pyrimidin-7-one (Sildenafil N-Oxide) 1094598-75-0 100mg



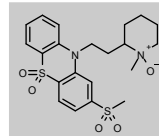
Strychnine Nitrate

[MM0658.02](#) Strychnine N-Oxide Hydrochloride 139369-62-3 100mg



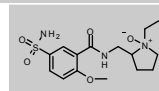
Sulforidazine

[MM1195.04](#) Sulforidazine 5-Sulfone N-Oxide (Sulforidazine N,S5,S5-Trioxide) 53926-90-2 100mg



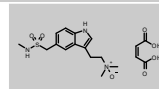
Sulpiride

[MM0051.06](#) **Imp. F** (EP): 1-Ethyl-2-[[[(2-methoxy-5-sulphamoylbenzoyl)amino]methyl]pyrrolidine 1-Oxide (Sulpiride N-Oxide) n/a 100mg



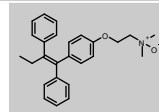
Sumatriptan Succinate

[MM0310.04](#) **Imp. D** (EP) as Maleate: N,N-Dimethyl-2-[5-[(methylsulfonyl)methyl]-1H-indol-3-yl]-ethanamine N-Oxide Maleate n/a 100mg



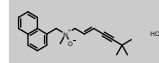
Tamoxifen Citrate

[MM0053.18](#) Tamoxifen N-Oxide 75504-34-6 100mg



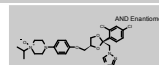
Terbinafine Hydrochloride

[MM0696.12](#) Terbinafine N-Oxide Hydrochloride n/a 100mg

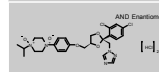


Terconazole

[MM1286.03](#) Terconazole N-Oxide n/a 100mg

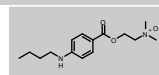


[MM1286.04](#) Terconazole Di-N-oxide Dihydrochloride n/a 100mg



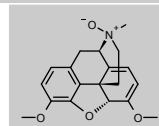
Tetracaine Hydrochloride

[MM0504.02](#) Tetracaine N-Oxide 55750-02-2 100mg



Thebaine

[MM0244.01](#) Thebaine N-Oxide 81600-02-4 100mg

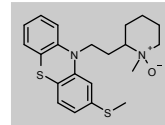


Thioridazine Hydrochloride

[MM0116.07](#) Thioridazine N-Oxide

103827-30-1

50mg

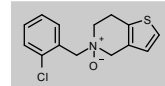


Ticlopidine Hydrochloride

[MM0150.16](#) Ticlopidine N-Oxide

79923-55-0

100mg

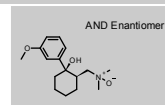


Tramadol Hydrochloride

[MM0007.11](#) Tramadol N-Oxide

147441-56-3

100mg



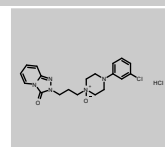
Trazodone Hydrochloride

[MM0421.13](#)

Imp. A (BP) as Hydrochloride: 4-(3-Chloro-phenyl)-1-[3-(3-oxo-2,3-dihydro-1,2,4-triazolo[4,3-a]pyridin-2-yl)propyl]piperazine N¹-Oxide Hydrochloride (Trazodone N-Oxide Hydrochloride)

55290-66-9

50mg

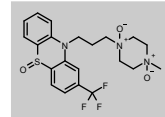


Trifluoperazine Hydrochloride

[MM0441.07](#)Trifluoperazine Sulfoxide N₁,N₄-Dioxide (Trifluoperazine N₁,N₄,S-Trioxide)

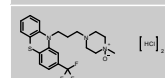
150111-58-3

100mg

[MM0441.08](#)Trifluoperazine N₄-Oxide Dihydrochloride

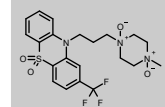
n/a

100mg

[MM0441.09](#)Trifluoperazine Sulfone N₁,N₄-Dioxide (Trifluoperazine N₁,N₄,S,S-Tetraoxide)

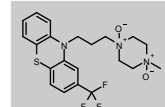
n/a

100mg

[MM0441.11](#)Trifluoperazine N₁,N₄-Dioxide

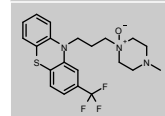
150111-57-2

100mg

[MM0441.12](#)Trifluoperazine N₁-Oxide

52172-24-4

100mg



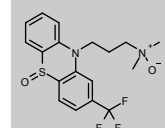
Triflupromazine Hydrochloride

[MM1675.04](#)

Triflupromazine Sulfoxide N-Oxide (Triflupromazine N,S-Dioxide)

94163-91-4

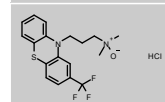
100mg

[MM1675.08](#)

Triflupromazine N-Oxide Hydrochloride

n/a

100mg

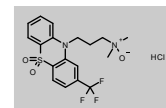


[MM1675.09](#)

Triflupromazine Sulfone N-Oxide Hydrochloride
(Triflupromazine N,S,S-Trioxide Hydrochloride)

n/a

100mg



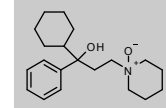
Trihexyphenidyl Hydrochloride

[MM0237.04](#)

Trihexyphenidyl N-Oxide

161564-79-0

50mg



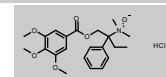
Trimebutine

[MM0417.17](#)

Trimebutine N-Oxide Hydrochloride

n/a

100mg



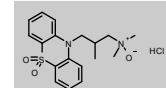
Trimeprazine Tartrate

[MM0958.04](#)

Trimeprazine Sulphone N-Oxide Hydrochloride
(Oxomemazine N-Oxide Hydrochloride)

n/a

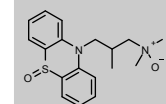
100mg


[MM0958.07](#)

Trimeprazine Sulfoxide N-Oxide (Trimeprazine N,S-Dioxide)

n/a

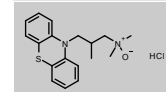
100mg


[MM0958.08](#)

Trimeprazine N-Oxide Hydrochloride

n/a

100mg



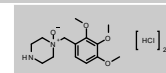
Trimetazidine Dihydrochloride

[MM0539.13](#)

Trimetazidine N-Oxide Dihydrochloride

n/a

100mg



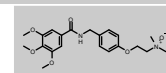
Trimethobenzamide Hydrochloride

[MM3281.02](#)

Trimethobenzamide N-Oxide

n/a

100mg

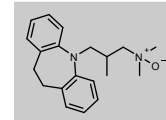


Trimipramine Maleate

[MM0240.04](#)
Imp. A (EP): (2RS)-3-(10,11-Dihydro-5H-dibenzo-
[b,f]azepin-5-yl)-N,N,2-trimethylpropan-1-amine
N-oxide (Trimipramine N-Oxide)

14171-70-1

100mg



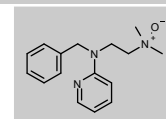
Tripelennamine Hydrochloride

[MM1631.01](#)

Tripelennamine N-Oxide

60317-19-3

100mg



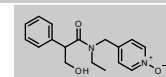
Tropicamide

[MM0601.05](#)

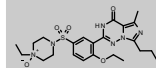
Tropicamide N-Oxide

n/a

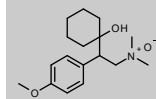
100mg



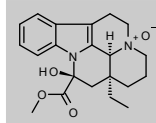
Vardenafil Hydrochloride Trihydrate

MM1569.03	Vardenafil N-Oxide	448184-48-3	100mg	
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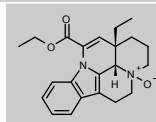
Venlafaxine Hydrochloride

MM0393.14	Venlafaxine N-Oxide	1094598-37-4	100mg	
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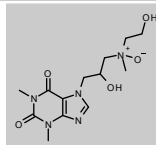
Vincamine

MM0519.02	Vincamine N-Oxide	51442-60-5	100mg	
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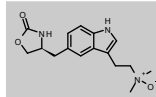
Vinpocetine

MM0406.06	Vinpocetine N-Oxide	109741-24-4	100mg	
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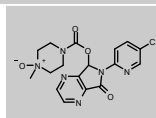
Xanthinol Nicotinate

MM1048.01	Xanthinol N-Oxide	n/a	100mg	
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Zolmitriptan

MM0298.05	Zolmitriptan N-Oxide	251451-30-6	100mg	
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Zopiclone

MM0149.01	Imp. A (EP): (5RS)-6-(5-Chloropyridin-2-yl)-7-oxo-6,7-dihydro-5H-pyrrolo[3,4-b]pyrazin-5-yl 4-Methylpiperazine-1-carboxylate 4-Oxide (Zopiclone Oxide)	43200-96-0	100mg	
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