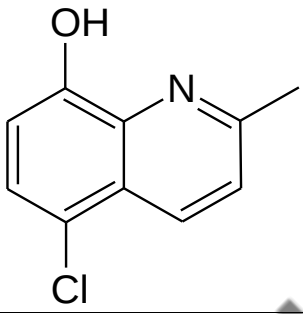
Our Formula. Your Success.

Reference Material Product Information Sheet



Name	5-chloro-2-methylquinolin-8-ol
Synonym(s)	5-chloro-8-hydroxyquinaldine; 5-chloro-8-hydroxy-2-methylquinoline; 5-chlor-2-methyl-8-chinolinol; 5-chlor-8-hydroxy-chinaldin
Epichem Item #	EPL-AA121 Batch 2
CAS #	24263-93-2
Molecular Formula	$C_{10}H_8ClNO$
Molecular Weight	193.63 g/mol
Appearance	Beige crystalline powder
Melting Point	65.5-66.7°C
Combustion Analysis	Required (%): C:62.0; H:4.2; N:7.2. Found (%): C:62.0; H:4.1; N:7.2.
Purity*	99.7%
Date of Manufacture	17 August 2016
Storage Requirements	Protect from heat, light and moisture.
Special Precautions	**This compound is for laboratory use only. Its toxicological properties may not have been fully established. It should be handled only by suitably qualified personnel.**
Intended Use	This compound is suitable for the identification of impurities and degradants in pharmaceutical materials. The purity assay is considered as relative contribution.
Date of Shipment	TBA
	This certificate is valid for one year from the date of shipment provided the substance is unopened and stored under the recommended conditions.
Retest Date	TBA (Proper Storage and Handling Required)

EPL-AA121 Batch 2

Epichemistry Pty Limited, Suite 11, 3 Brodie-Hall Drive, Bentley WA 6102, Australia
Tel + 61 8 9363 7888 www.epichem.com ABN 50 670 849 377

I. Identity

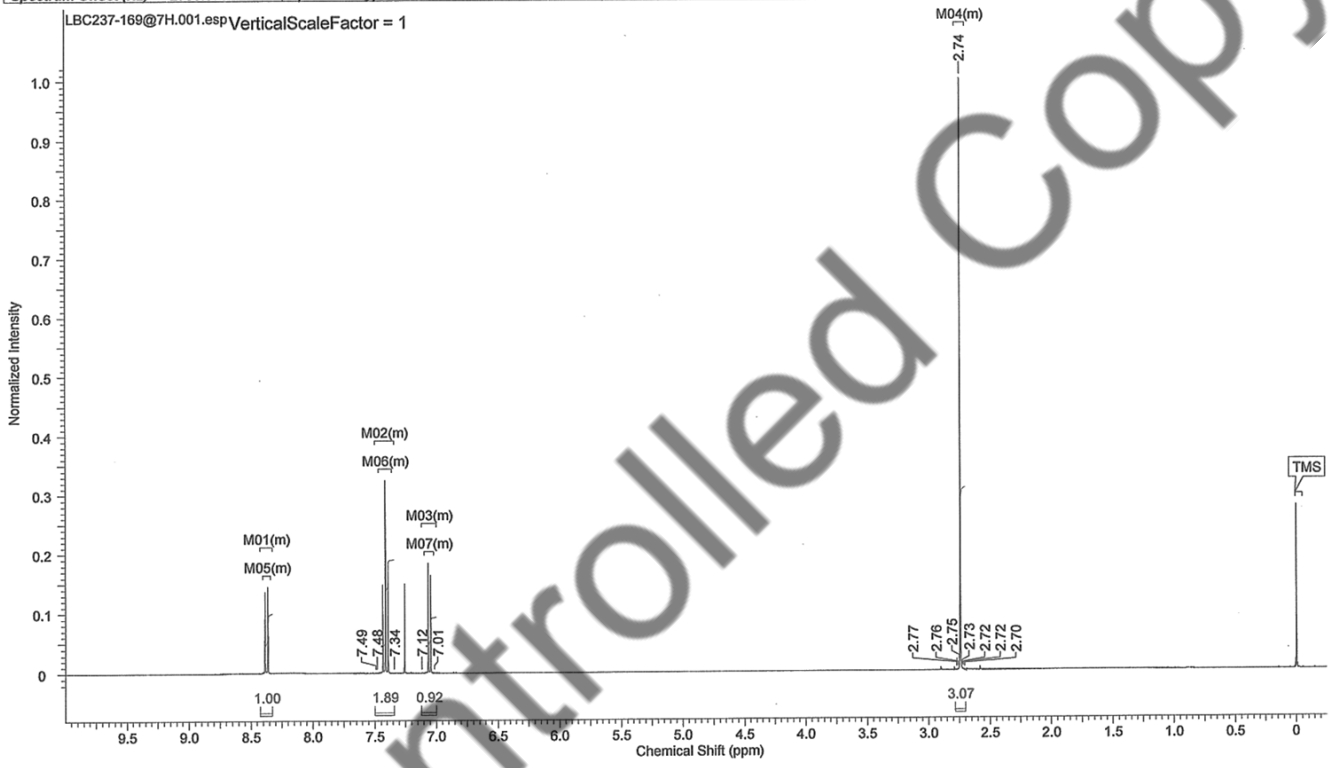
The identity of this product was established using the following analyses:

Ia. [1]HNMR Spectrum

Conditions: 400 MHz, $CDCl_3$

[1]HNMR spectrum consistent with chemical structure.

Acquisition Time (sec)	3.7547	*Comment*	LBC237-169@7H 1H CDCl3 {E:\dataexternal\epichem} cygoh 5	*Date*	03 Aug 2016 17:04:00		
Date Stamp	03 Aug 2016 17:04:00			*File Name*	\\NAPHTHALENE\Company\NMR files\LBC237\LBC237-169@7H\1\fid		
Frequency (MHz)	400.13	*Nucleus*	1H	*Number of Transients*	8	*Origin*	spect
Original Points Count	24038	*Owner*	nmr	*Points Count*	32768	*Pulse Sequence*	zg
Receiver Gain	128.00	*SW(cyclical) (Hz)*	6402.05	*Solvent*	CHLOROFORM-d		
Spectrum Offset (Hz)	2790.0781	*Spectrum Type*	STANDARD	*Sweep Width (Hz)*	6401.85	*Temperature (degree C)*	26.945



EPL-AA121 Batch 2

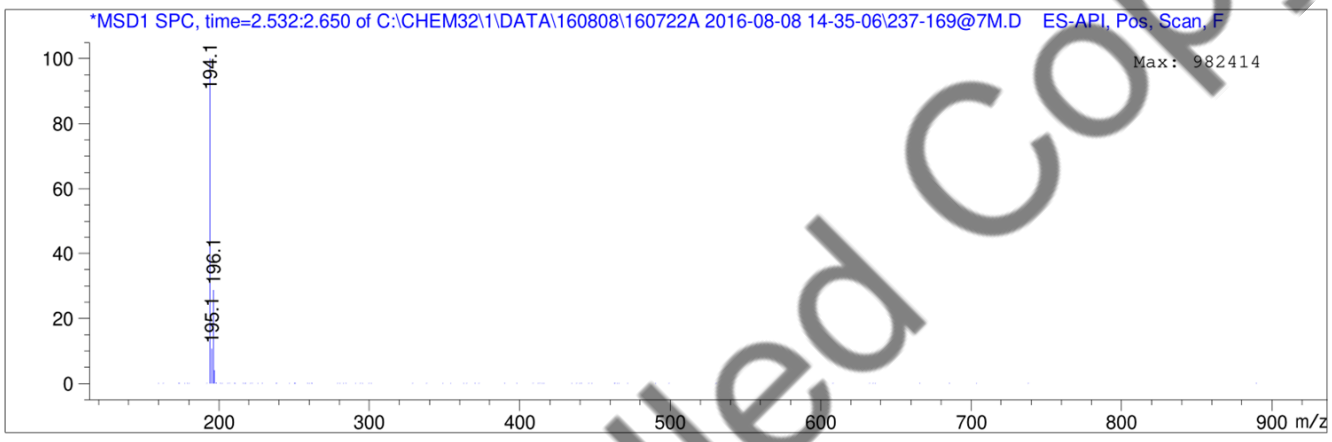
Ib. Mass Spectrum

The mass spectrum of this material was analysed by Liquid Chromatography Mass Spectroscopy (LCMS) using in-house EM005.WI08.

Method: 5% to 100% ACN in water gradient (+0.1% formic acid)

Poroshell 120 EC-C18, 4.6 x 50 mm, 2.7 micron

Retention Time (MS)	MS Area	Mol. Weight or Ion
2.567	19289028	196.10 I
		195.10 I
		194.10 I



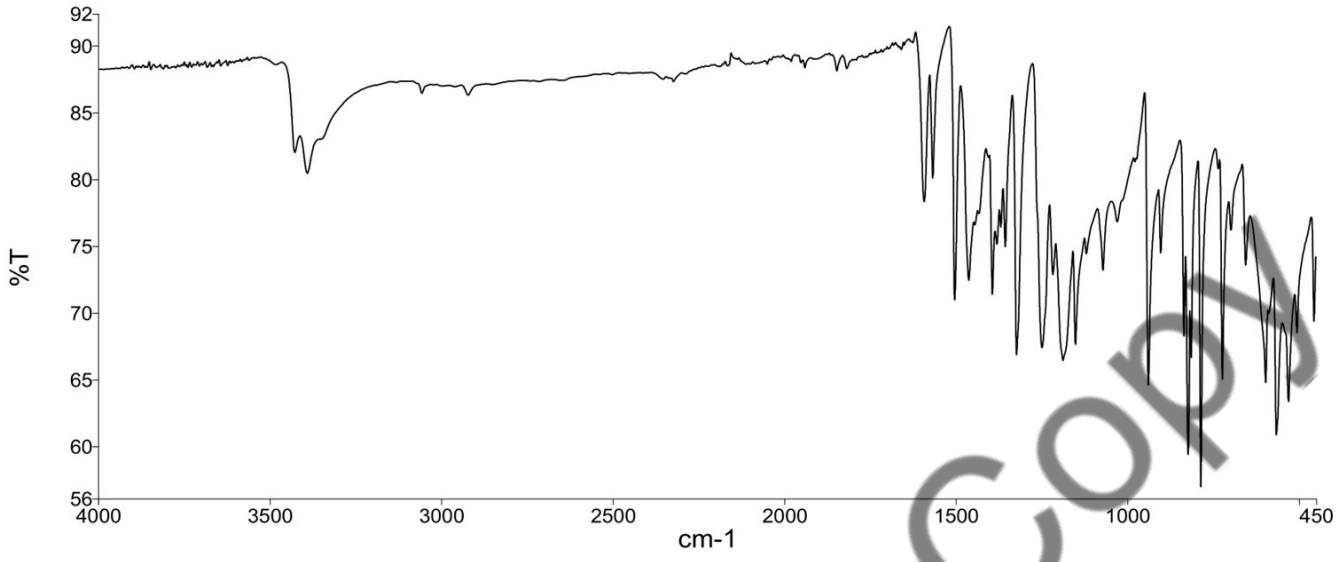
Theoretical value: 194.1 $[M+H]^+$.

The signal of the Mass Spectrum is consistent with the theoretical value and its interpretation is consistent with the structural formula.

Epichemistry Pty Limited, Suite 11, 3 Brodie-Hall Drive, Bentley WA 6102, Australia
Tel + 61 8 9363 7888 www.epichem.com ABN 50 670 849 377

Ic. IR Spectrum

The infra-red spectrum of this material was analysed by Fourier-Transform Infrared Spectroscopy (FTIR) using in-house EM005.WI09.



The interpretation of the signals of the Fourier-Transform Infrared Spectrum is consistent with the structural formula.

Epichemistry Pty Limited, Suite 11, 3 Brodie-Hall Drive, Bentley WA 6102, Australia
Tel + 61 8 9363 7888 www.epichem.com ABN 50 670 849 377

II. Purity

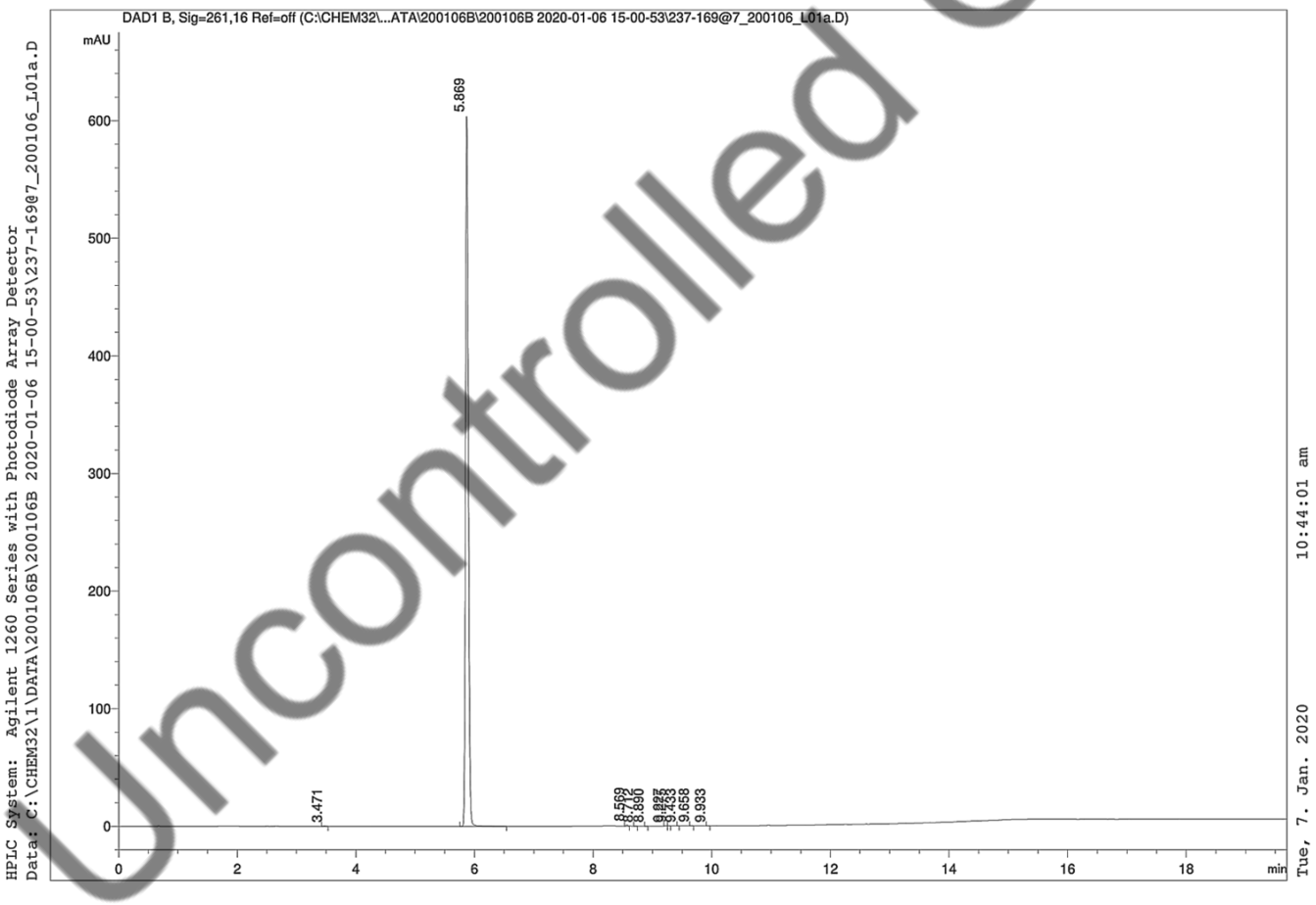
The purity of this material was analysed by high performance liquid chromatography (HPLC) using in-house EM005.WI07.

HPLC Conditions:

<table>
<tr><td>Column</td><td colspan="4">Conditions</td><td>Detector</td><td>Injector</td></tr>
<tr><td rowspan="8">Agilent Poroshell 120 EC-C18

4.6 x 50mm

2.7 micron</td><td colspan="4">25ºC</td><td rowspan="8">DAD
261nm</td><td rowspan="8">Auto
1.0 µL
0.15 mg/mL in water (+0.1% TFA)</td></tr>
<tr><td>Time (min)</td><td>% Line A (Water + 0.1% (v/v) TFA)</td><td>% Line B (Acetonitrile + 0.1% (v/v) TFA)</td><td>Flow rate (mL/min)</td></tr>
<tr><td>0.00</td><td>95</td><td>5</td><td>1.0</td></tr>
<tr><td>6.00</td><td>80</td><td>20</td><td>1.0</td></tr>
<tr><td>13.50</td><td>5</td><td>95</td><td>1.0</td></tr>
<tr><td>18.50</td><td>5</td><td>95</td><td>1.0</td></tr>
<tr><td>19.50</td><td>95</td><td>5</td><td>1.0</td></tr>
<tr><td>22.50</td><td>95</td><td>5</td><td>1.0</td></tr>
</table>



EPL-AA121 Batch 2

Area Percent Report – Sorted by Signal

Peak Number	Retention Time (rounded)	Area	Area % (rounded)
1	3.47	0.66	0.03
2	5.87	1971.09	99.84
3	8.57	1.86	0.09
4	8.71	0.08	0.00
5	8.89	0.05	0.00
6	9.23	0.10	0.00
7	9.27	0.10	0.01
8	9.43	0.03	0.00
9	9.66	0.23	0.01
10	9.93	0.05	0.00
Totals			100 (rounded)

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

Results:

Average 99.8% (average of 10 duplicate analyses)

EPL-AA121 Batch 2

III. Water Content

Method: Karl-Fischer titration using in-house EM005.WI04.

Results:

Average 0.1%

IV. Ash Content

Method: BP 2016 Ash (Appendix XI J) as per WS001/C29155

Result:

Contains <0.1% ash.

V. Residual Solvents

Method: ^{1}HNMR

Result:

No significant impurities detected by ^{1}H NMR analysis.

VI. Final Result

Chromatographic purity (HPLC)	99.8%
Water content	0.1%
Ash content	<0.1%
Residual solvents	<0.1%
Purity*	99.7%

This purity is assessed to be 99.7%.

Product Reviewed By:

James Rixson, PhD
Head of Fine Chemicals & Technical Services

Product Released By:

Boon Tan
Quality Manager

Release Date: 7 January 2020

**NATA accreditation does not cover the performance of this service.*

The calculation of the purity follows the formula:

$$\text{Purity}(\%) = \frac{((\text{Chromatographicpurity[HPLC]})\text{x}(100 - (\text{watercontent} + \text{ashcontent} + \text{volatilecontents})))}{100}$$

EPL-AA121 Batch 2