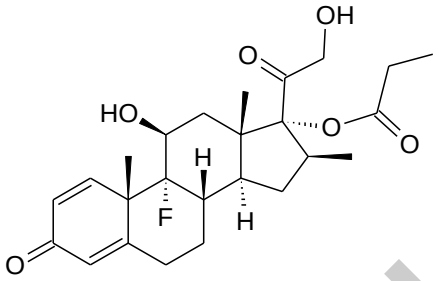
Our Formula. Your Success.

# Reference Material Product Information Sheet

Epichem's Quality System conforms to ISO9001:2015 as certified by ECAAS Pty Ltd - Certification number 616061.




| | |
|---|---|
| **Name** | (11β,16β)-9-Fluoro-11,21-dihydroxy-16-methyl-17-(1-oxopropoxy)pregna-1,4-diene-3,20-dione |
| **BP/EP Name** | Betamethasone Dipropionate Impurity B |
| **USP Name** | Betamethasone Dipropionate Related Compound B |
| **Synonym(s)** | Betamethasone 17-propionate, Betamethasone 17α-propionate |
| **Epichem Item #** | EPL-AA261 Batch 1 |
| **CAS #** | 5534-13-4 |
| **Molecular Formula** | $C_{25}H_{33}FO_6$ |
| **Molecular Weight** | 448.54 g/mol |
| **Appearance** | White powder |
| **Melting Point** | 216.7-224.6°C (decomposition). |
| **Combustion Analysis** | Required (%): C:67.0; H:7.4; N:0.0. Found (%): C:66.8; H:7.4; N:0.0. |
| **Purity** | 98.2% |
| **Date of Manufacture** | 8 May 2020 |
| **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 stored under the recommended conditions. |
| **Retest Date** | TBA (Proper Storage and Handling Required) |

Uncontrolled Copy



Epichem Pty Ltd, Suite 5, 3 Brodie-Hall Drive, Bentley WA 6102, Australia
Tel + 61 (0)8 6167 5200 Fax + 61 (0)8 6167 5201 www.epichem.com.au ABN 80 106 769 902

## I. Identity

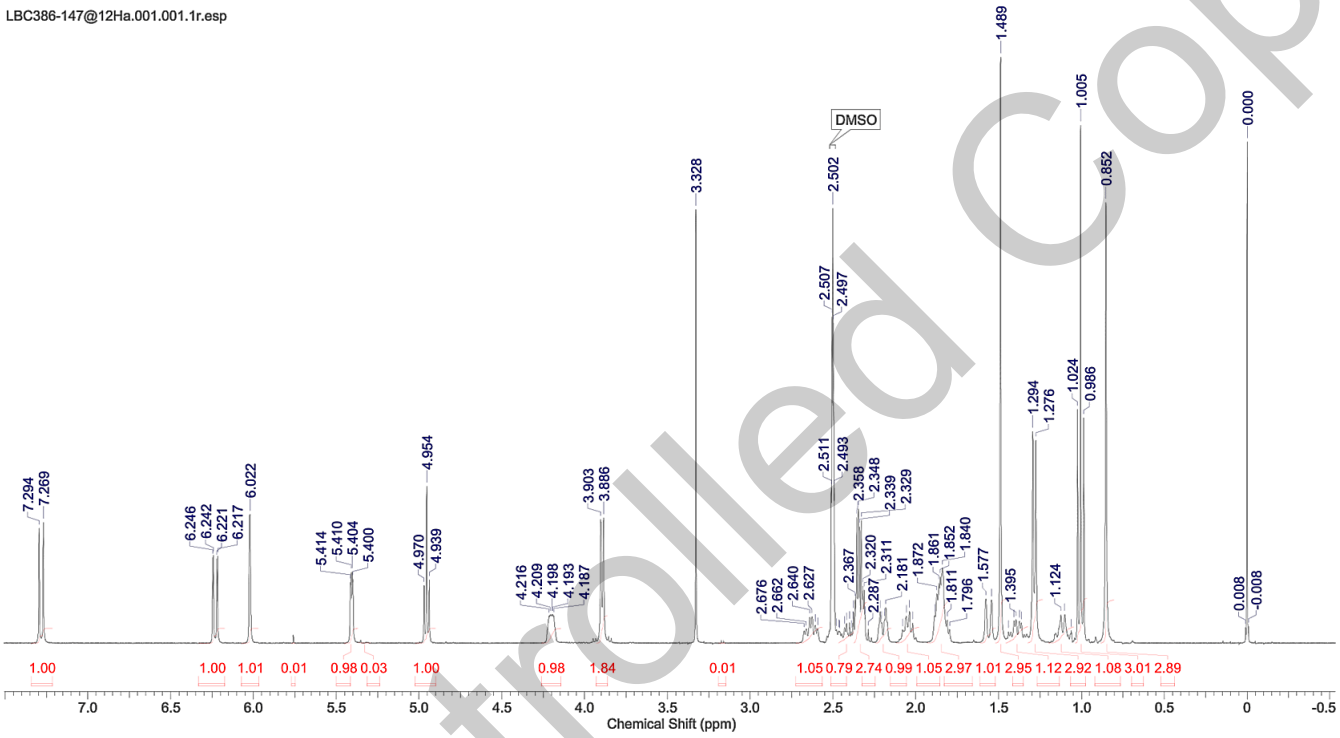
The identity of this product was established using the following analyses:

## Ia. $^{1}$HNMR Spectrum

Conditions: 400 MHz, DMSO-$d_6$
$^{1}$HNMR spectrum consistent with chemical structure.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Acquisition Time (sec)* | 3.7547 | *Comment* | LBC386-147@12Ha 1H DMSO {E:\dataexternal\epichem} cygoh 12 | | | | |
| *Date* | 05 May 2020 08:57:36 | | | *Date Stamp* | 05 May 2020 08:57:36 | | |
| *File Name* | \\naphthalene\company\NMR files\LBC386-147@12Ha\1\pdata\1\1r | | | | | *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* | DMSO-d6 | *Spectrum Offset (Hz)* | 2798.1926 | *Spectrum Type* | STANDARD |
| *Sweep Width (Hz)* | 6401.85 | *Temperature (degree C)* | 22.396 | | | | |

LBC386-147@12Ha.001.001.1r.esp




Uncontrolled Copy



Epichem Pty Ltd, Suite 5, 3 Brodie-Hall Drive, Bentley WA 6102, Australia
Tel + 61 (0)8 6167 5200 Fax + 61 (0)8 6167 5201 www.epichem.com.au ABN 80 106 769 902

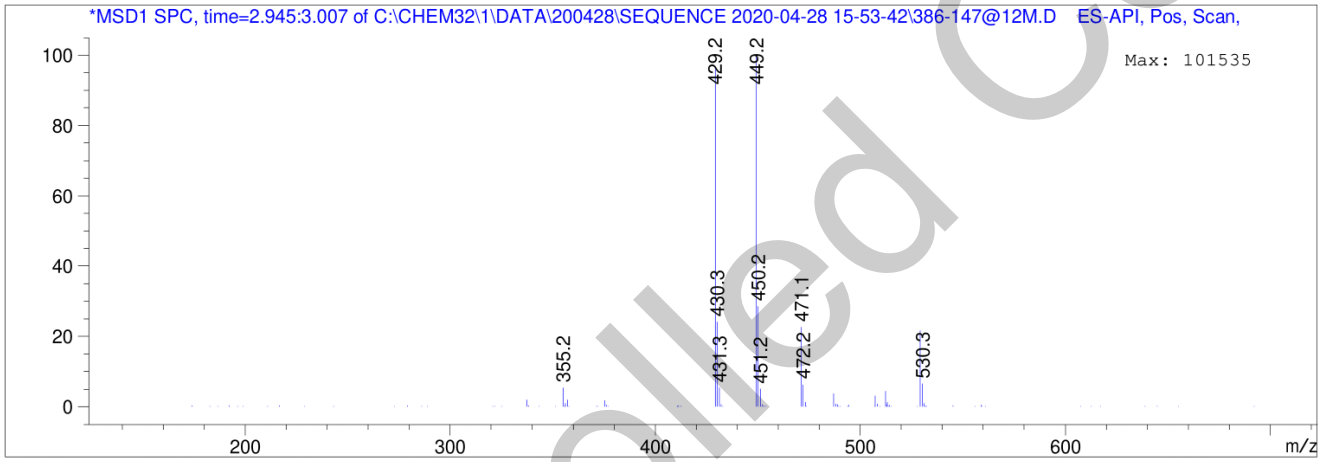
## Ib. Mass Spectrum

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

Method: ACN/water gradient (+ 0.1% formic acid).

ZORBAX SB-C8, 4.6 x 30 mm, 3.5 micron.

| Retention Time (MS) | MS Area | Mol. Weight or Ion |
|---|---|---|
| 2.972 | 2178923 | 529.25 I |
| | | 471.15 I |
| | | 450.20 I |
| | | 449.20 I |
| | | 430.25 I |
| | | 429.20 I |




Theoretical values: 449.2 $[M+H]^+$

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

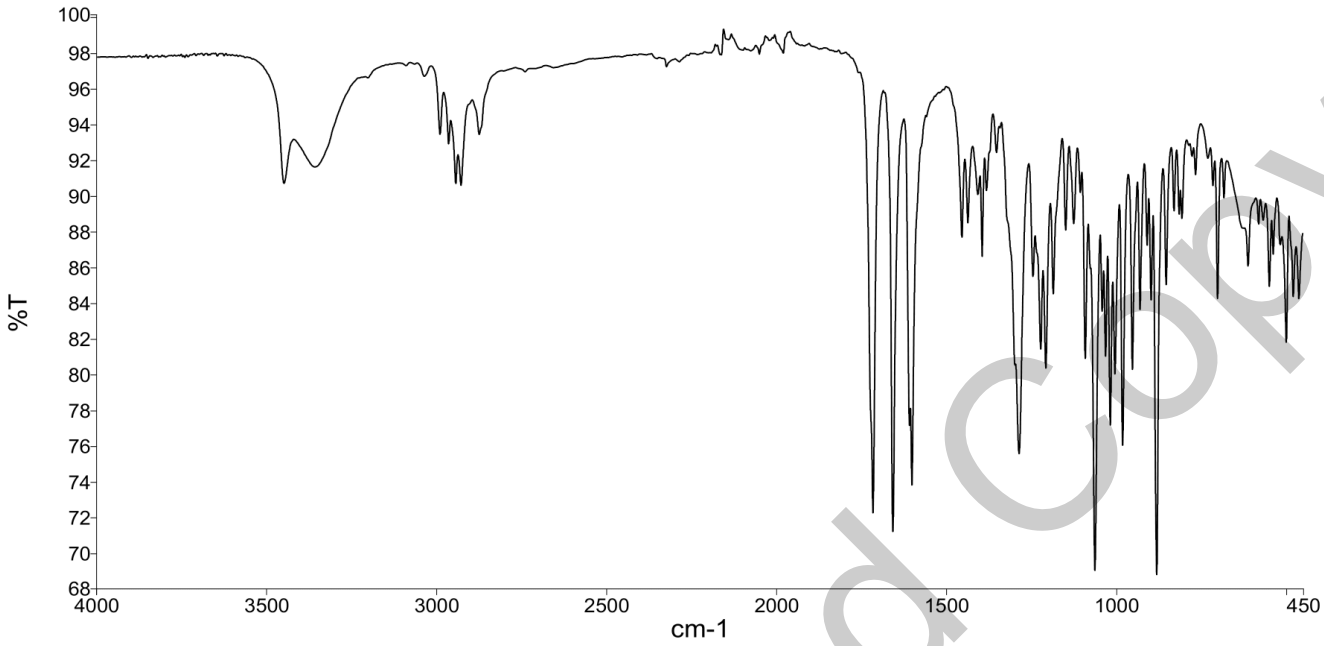
Uncontrolled Copy



Epichem Pty Ltd, Suite 5, 3 Brodie-Hall Drive, Bentley WA 6102, Australia
Tel + 61 (0)8 6167 5200 Fax + 61 (0)8 6167 5201 www.epichem.com.au ABN 80 106 769 902

## 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.

Uncontrolled Copy



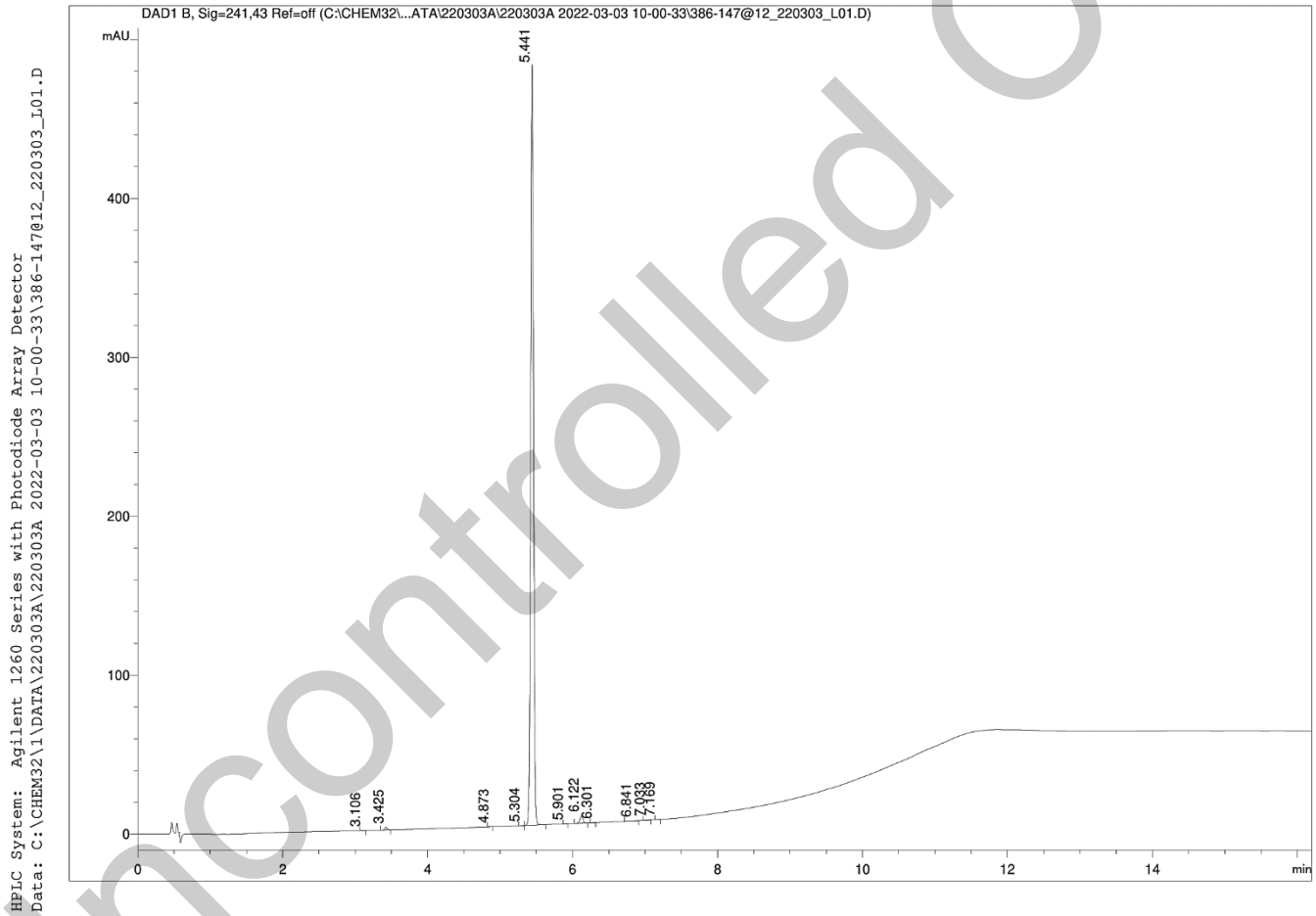
Epichem Pty Ltd, Suite 5, 3 Brodie-Hall Drive, Bentley WA 6102, Australia
Tel + 61 (0)8 6167 5200 Fax + 61 (0)8 6167 5201 www.epichem.com.au ABN 80 106 769 902

## II. Purity

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

## HPLC Conditions:

| Column | Conditions | | | | Detector | Injector |
|---|---|---|---|---|---|---|
| Agilent Poroshell 120 EC-C18<br><br>4.6 x 50mm<br><br>2.7 micron | 25ºC | | | | DAD<br><br>241nm | Auto<br><br>1.0 µL<br><br>0.8 mg/mL in 100% acetonitrile (NO MODIFIERS) |
| | Time (min) | % Line A (Water + 0.1% (v/v) TFA) | % Line B (Acetonitrile + 0.1% (v/v) TFA) | Flow rate (mL/min) | | |
| | 0.00 | 75 | 25 | 1.0 | | |
| | 6.00 | 45 | 55 | 1.0 | | |
| | 10.00 | 5 | 95 | 1.0 | | |
| | 15.00 | 5 | 95 | 1.0 | | |
| | 16.00 | 75 | 25 | 1.0 | | |
| | 19.00 | 75 | 25 | 1.0 | | |




Uncontrolled Copy



Epichem Pty Ltd, Suite 5, 3 Brodie-Hall Drive, Bentley WA 6102, Australia
Tel + 61 (0)8 6167 5200 Fax + 61 (0)8 6167 5201 www.epichem.com.au ABN 80 106 769 902

**Area Percent Report – Sorted by Signal**

| Peak Number | Retention Time (rounded) | Area | Area % (rounded) |
|---|---|---|---|
| 1 | 3.11 | 0.13 | 0.01 |
| 2 | 3.43 | 3.97 | 0.30 |
| 3 | 4.87 | 0.15 | 0.01 |
| 4 | 5.30 | 0.29 | 0.02 |
| 5 | 5.44 | 1284.69 | 98.54 |
| 6 | 5.90 | 0.06 | 0.00 |
| 7 | 6.12 | 13.42 | 1.03 |
| 8 | 6.30 | 0.11 | 0.01 |
| 9 | 6.84 | 0.37 | 0.03 |
| 10 | 7.03 | 0.41 | 0.03 |
| 11 | 7.17 | 0.11 | 0.01 |
| 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 98.4% (average of duplicate runs)

Uncontrolled Copy



Epichem Pty Ltd, Suite 5, 3 Brodie-Hall Drive, Bentley WA 6102, Australia
Tel + 61 (0)8 6167 5200 Fax + 61 (0)8 6167 5201 www.epichem.com.au ABN 80 106 769 902

## III. Water Content

Method: Karl-Fischer titration using in-house EM005.WI04.
**Results:**
Average 0.1%

## IV. Ash Content

Method: BP2020 Ash Appendix XI J Method II
**Result:**
Contains <0.1% ash.

## V. Residual Solvents

Method: $^{1}$HNMR
**Result:**
0.1% Dichloromethane by $^{1}$H NMR analysis.

## VI. Final Result

| | |
|---|---|
| Chromatographic purity (HPLC) | 98.4% |
| Water content | 0.1% |
| Ash content | <0.1% |
| Residual solvents | 0.1% |
| Purity* | 98.2% |

This purity is assessed to be 98.2%.

Product Reviewed By:

Jacob Heppell, PhD
Chemist

Product Released By:

Carol Worth, PhD
Quality Manager
Release Date: 9 March 2022

---

The calculation of the purity follows the formula:

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

Uncontrolled Copy



Epichem Pty Ltd, Suite 5, 3 Brodie-Hall Drive, Bentley WA 6102, Australia
Tel + 61 (0)8 6167 5200 Fax + 61 (0)8 6167 5201 www.epichem.com.au ABN 80 106 769 902