



ISO 9001:2015
Certification
ISO 16128-1 ISO 16128-2-2017 EPA www.epa.gov/greenchemistry

**KAMPOYAKI NATURAL
PRODUCTS BIO-CHEMISTRY**

www.kampoyaki-research.com

Email: thiru-sam@kampoyaki-research.com

BETULIN

Datasheet

Kampoyaki Novo-Drug Screening Libraries 4th Edition (Revised in July, 2016)

PRODUCT INFORMATION

Name: Betulin

Catalog No.: KRN98710

Cas No.: 473-98-3

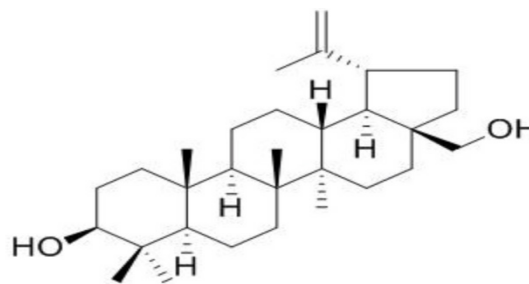
Purity: >=98%

M.F: C₃₀H₅₀O₂

M.W: 442.7

Physical Description: Powder

Synonyms: Lup-20(29)-ene-3b,28-diol.



POTENTIAL USES

1. Reference standards; **2.** Pharmacological research; **3.** Food and cosmetic research;
4. Synthetic precursor compounds; **5.** Active Pharmaceutical Intermediates (API) & Fine Chemicals; **6.** Ingredient in supplements, beverages; **7.** Agricultural research; **8.** Botanical Bio- Allelopathy, **9.** Natural Botanical Molecules as Botanical Bio-Herbicides **10.** As Botanical Bio- Anti-Blight Fungicides

SOURCE

The heartwoods of *Caesalpinia sappan* L.

BIOLOGICAL ACTIVITY OR INHIBITORS

Betulin is an abundant naturally occurring triterpene and it is found predominantly in bushes and trees forming the principal extractive (up to 30% of dry weight) of the bark of birch trees, it has antimalarial and anti-inflammatory activities; it and its derivatives have especially shown anti-HIV activity and cytotoxicity against a variety of tumor cell lines comparable to some clinically used drugs .[1] Betulinic acid and its derivatives have cytotoxicity, they have potent anti-tumor activity especially in combination with cholesterol.[2]

Betulinic acid has anti-AIDS activity.[3]

Betulin has inhibition of sterol regulatory element-binding proteins (SREBPs), SREBPs are major transcription factors activating the expression of genes involved in biosynthesis of cholesterol, fatty acid and triglyceride, inhibition SREBP pathway can be employed as a therapeutic strategy to treat metabolic diseases including type II diabetes and atherosclerosis; thus betulin can improve hyperlipidemia and insulin resistance and reduce atherosclerotic plaques.[4]

Betulin and betulinic acid inhibit ethanol-induced activation of hepatic stellate cells (HSCs) on different levels, acting as antioxidants, inhibitors of cytokine production, and inhibitors of tumor growth factor- β (TGF- β), and nuclear factor- κ B (NF κ B)/I κ B transduction signaling; betulin is also inhibitor of both JNK and p38 MAPK signal transduction, while betulinic acid inhibits only c-Jun N-terminal kinase (JNK), suggests that they are promising agents for anti-fibrotic combination therapies.[5]

SOLVENT

Pyridine, Methanol, Ethanol, Hot water, etc.

HPLC METHOD (6)

Mobile phase: Acetonitrile- H₂O=86:14 ;

Flow rate: 1.0 ml/min;

Column temperature: Room Temperature;

Flow rate of air 210 nm.

STORAGE

2-8°C, Protected from air and light, refrigerate or freeze.

REFERENCES

- [1] Alakurtti S, Mäkelä T, Koskimies S, et al. *Eur. J. Pharm. Sci.*, 2006, 29(1):1-13.
- [2] Franziska B. Mullauer, Jan H. Kessler, Jan Paul Medema. *Plos One*, 2009, 4(4):e1-e1.
- [3] Sun C, Wang H K, Yoshiki Kashiwada , et al. *J. Med. Chem.*, 1998, 41(23):4648-57.
- [4] Tang J J, Li J G, Qi W, et al. *Cell Metab.*, 2011, 13(1):44-56.
- [5] Szuster-Ciesielska A, Plewka K, Daniluk J, et al. *Toxicology*, 2011, 280(3):152-63.
- [6] Zhao G, Yan W, Dan C. *J. Pharmaceut. Biomed. Anal.*, 2007, 43(3):959-62.



ISO 9001:2015
Certification
ISO 16128-1 ISO 16128-2-2017 EPA www.epa.gov/greenchemistry

KAMPOYAKI HERBS PTE LTD

16 New Industrial Road, #05-05 Hudson Techno Centre
Singapore 536204.

Tel: +65 63833202 | **Fax:** +65 63833632

Web: www.kampoyaki-research.com

E-mail: thiru-sam@kampoyaki-research.com

E-mail: kampoyak@singnet.com.sg

CERTIFICATE OF ANALYSIS

Name: Betulin

Catalog No.: KRN98710

Cas No.: 473-98-3

Purity: >=98%

M.F: C₃₀H₅₀O₂

Physical Description: Powder

Solvent: Pyridine, Methanol, Ethanol, etc.

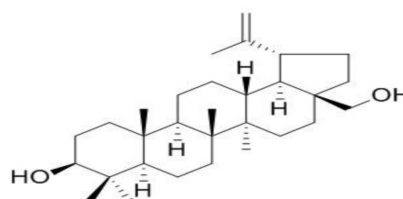
Weight 20mg

Lot No. KRS201802

Storage Protected from air and light, refrigerate or freeze (2-8 °C)

Intended Use For laboratory use only

Shelf Life 2 years



CHARACTERIZATION DATA SUMMARY

Analytical Test

Identification by , ¹H-NMR , HPLC
Purity tested

Results

Consistent with the above structure
>= 98%



ISO 9001:2015
Certification
ISO 16128-1 ISO 16128-2-2017 EPA www.epa.gov/greenchemistry

KAMPOYAKI HERBS PTE LTD

16 New Industrial Road, #05-05 Hudson Techno Centre
Singapore 536204.

Tel: +65 63833202 | **Fax:** +65 63833632

Web: www.kampoyaki-research.com

E-mail: thiru-sam@kampoyaki-research.com

E-mail: kampoyak@singnet.com.sg

GHS SAFETY DATA SHEET

Version 4.2

Revision Date 01/01/2018

Print Date 01/08/2019

1. PRODUCT AND COMPANY IDENTIFICATION

GHS Product Name: Betulin

Product code: KRN98710

Company: KAMPOYAKI HERBS PTE LTD

Address: 16 New Industrial Road, #05-05 Hudson Techno Centre Singapore 536204

Tel: +65-63833202

Fax: +65-63833632

Website: www.kampoyaki-research.com

E-mail: thiru-sam@kampoyaki-research.com | kampoyak@singnet.com.sg

2. HAZARDS IDENTIFICATION

2.1 GHS classification

Physical Hazards: Not classified

Health Hazards: Not classified

Environmental Hazards: Not classified

2.2 GHS label elements, including precautionary statements

Pictograms or hazard symbols: None

Signal word: No signal word

Hazard statements: None

Precautionary statements: None

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name: Betulin

CAS#: 473-98-3

Purity: $\geq 98\%$

Formula: $C_{30}H_{50}O_2$

Molecular Weight: 442.7

Hazard Symbols: ---

Risk Phrases: ---

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Consult a doctor.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Consult a doctor.

Ingestion: Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Consult a doctor.

Inhalation: Remove from exposure and move to fresh air immediately. Consult a doctor.

4.2 Indication of immediate medical attention and special treatment needed

Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.

5. FIRE FIGHTING MEASURES

5.1 Suitable extinguishing

Media: Dry chemical, foam, water spray, carbon dioxide.

Precautions for firefighters: Fire-extinguishing work is done from the windward and the suitable fire-extinguishing method according to the surrounding situation is used. Uninvolved persons should evacuate to a safe place. In case of fire in the surroundings: Remove movable containers if safe to do so.

5.2 Special protective

Equipment for firefighters: When extinguishing fire, be sure to wear personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing vapors, mist or gas.

6.2 Environmental precautions

Do not let product enter drains.

6.3 General Information

Use proper personal protective equipment as indicated in Section 8.

6.4 Spills/Leaks

Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Decontaminate spill site with 10% caustic solution and ventilate area until after disposal is complete

7. HANDLING AND STORAGE

7.1 Precautions for safe handling:

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Keep away from sources of ignition. Avoid prolonged or repeated exposure.

7.2 Storage

Store in a well closed container. Protected from air and light, refrigerate or freeze.(2-8°C)

7.3 Specific end uses

Use in a laboratory fume hood where possible. Refer to employer is COSHH risk assessment.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Engineering controls

Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Control parameters: Not set up

8.2 Personal protective equipment

Respiratory protection: Dust respirator. Follow local and national regulations.

Hand protection: Protective gloves.

Eye protection: Wear safety glasses and chemical goggles if splashing is possible.

Skin and body protection: Wear appropriate protective gloves and clothing to prevent skin exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

- a) Appearance Yellow powder
- b) Odour no data available
- c) Odour Threshold no data available
- d) pH no data available
- e) Melting point/freezing point no data available
- f) Initial boiling point and boiling range no data available
- g) Flash point no data available
- h) Evaporation rate no data available
- i) Flammability (solid, gas) no data available
- j) Flammability or explosive limits no data available
- k) Vapour pressure no data available
- l) Vapour density
- m) Relative density no data available
- n) Water solubility no data available
- o) Partition coefficient: no data available
- p) Autoignition temperature no data available
- q) Decomposition temperature no data available
- r) Viscosity no data available
- s) Explosive properties no data available
- t) Oxidizing properties no data available

10 - STABILITY AND REACTIVITY

10.1 Reactivity

Stable under recommended transport or storage conditions.

10.2 Chemical Stability

Stable under normal temperatures and pressures.

10.3 Conditions to Avoid

Incompatible materials, strong oxidants, heat.

10.4 Incompatibilities with Other Materials

Strong oxidising/reducing agents, strong acids/alkalis.

10.5 Hazardous Decomposition Products

Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, nitrogen.

10.6 Hazardous Polymerization

Has not been reported.

11. TOXICOLOGICAL INFORMATION

| | |
|---------------------------------------|-------------------|
| Acute Toxicity: | No data available |
| Skin corrosion/irritation: | No data available |
| Serious eye damage/irritation: | No data available |
| Germ cell mutagenicity: | No data available |
| Carcinogenicity: | --- |
| IARC: | No data available |
| NTP: | No data available |
| Reproductive toxicity: | No data available |

12. ECOLOGICAL INFORMATION

| | |
|--|--|
| Toxicity: | No data available |
| Persistence and degradability: | No data available |
| Bioaccumulative potential: | No data available |
| Mobility in soil: | No data available |
| Results of PBT and vPvB assessment: | No data available |
| Other adverse effects: | May be harmful to the aquatic environment. |

13. DISPOSAL CONSIDERATIONS

Dispose of in a manner consistent with federal, state, and local regulations.

14. TRANSPORT INFORMATION

14.1 Hazards Class:

Does not meet the criteria for classification as hazardous for transport

14.2 UN proper shipping name

ADR/RID: Not dangerous goods

IMDG: Not dangerous goods

IATA: Not dangerous goods

14.3 Transport hazard class(es)

Does not meet the criteria for classification as hazardous for transport.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

No data available

15.2 Chemical Safety Assessment

No data available

16. ADDITIONAL INFORMATION

This GHS SDS above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

End of GHS safety data sheet



ISO 9001:2015
Certification
ISO 16128-1 ISO 16128-2-2017 EPA www.epa.gov/greenchemistry

KAMPOYAKI HERBS PTE LTD

16 New Industrial Road, #05-05 Hudson Techno Centre
Singapore 536204.

Tel: +65 63833202 | **Fax:** +65 63833632

Web: www.kampoyaki-research.com

E-mail: thiru-sam@kampoyaki-research.com

E-mail: kampoyak@singnet.com.sg

