



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

NARINGIN

Datasheet

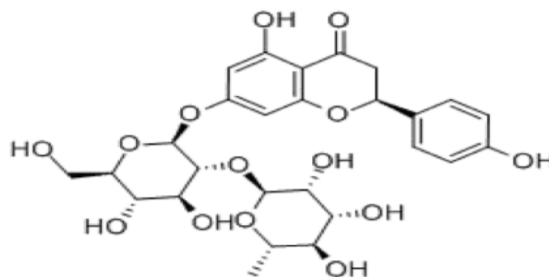
Kampoyaki Novo-Drug Screening Libraries 4th Edition (Revised in July, 2016)

PRODUCT INFORMATION

Name: Naringin
Catalog No.: KRN99555
Cas No.: 10236-47-2
Purity: >=98%
M.F: C₂₇H₃₂O₁₄
M.W: 580.53

Physical Description: Powder

Synonyms: (s)-yranosyl]oxy]-; Naringoside; Isohesperidin ; 4H-1-Benzopyran-4-one,7-[[-(s)-2-O-(6-deoxy- α -L-mannopyranosyl)- β -D-glucopyranosyl]oxy]-2,3-dihydro-5-hydroxy-2-(4-hydroxyphenyl)-,(S)-.



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 peel of Citrus maxima.

BIOLOGICAL ACTIVITY OR INHIBITORS

Naringin, a flavonoid in grapefruit and citrus, exhibits antioxidant effects, it reduces Ara-C-induced oxidative stress through both an inhibition of the generation of ROS production and an increase in antioxidant enzyme activities; it blocks apoptosis caused by Ara-C-induced oxidative stress, resulting in the inhibition of the cytotoxicity of Ara-C.^[1]

Naringin is a major and selective clinical inhibitor of organic anion-transporting polypeptide 1A2 (OATP1A2) in grapefruit juice, it is a single dietary constituent clinically modulating drug transport.^[2]

Naringin has anti-atherogenic effects, the effect is involved with a decreased hepatic cholesterol acyltransferase (ACAT) activity and with the downregulation of vascular cell adhesion molecule-1 (VCAM-1) and monocyte chemoattractant protein-1 (MCP-1) gene expression. ^[3]

Naringin and hesperidin both play important roles in preventing the progression of hyperglycemia, partly by increasing hepatic glycolysis and glycogen concentration and/or by lowering hepatic gluconeogenesis.^[4]

Naringin has protective effects against post-stroke depression induced neurobehavioral, biochemical and cellular alterations in mice, the nitric oxide mechanism involves in it.^[5]

Naringin possesses anti-liperoxidative and antioxidant activity in experimentally induced cardiac toxicity, has cardioprotective potential.^[6]

Naringin inhibits growth potential of human triple-negative breast cancer cells by targeting β -catenin signaling pathway, it may be used as a potential supplement for the prevention and treatment of breast cancer.^[7]

Naringin attenuates epidermal growth factor (EGF)-induced MUC5AC secretion in A549 cells by suppressing the cooperative activities of MAPKs-AP-1 and IKKs-I κ B-NF- κ B signaling pathways.^[8]

Naringin and lovastatin contribute to hypocholesterolemic action via down-regulated ACAT activity and higher excretion of fecal sterols in response to high-cholesterol feeding, naringin supplement seems to preserve tissue morphology from damages induced by high cholesterol diet.^[9]

Naringin has antiulcer effects on gastric lesions induced by ethanol in rats.^[10]

Naringin has protective effect against colchicine-induced cognitive dysfunction and oxidative damage in rats, it also has neuroprotective effect by modulation of endogenous biomarkers in streptozotocin induced painful diabetic neuropathy.^[11,12]

SOLVENT

Pyridine, Methanol, Ethanol, etc.

HPLC METHOD (9)

Mobile phase: Methanol -H₂O-Glacial acetic acid=30:68:2 ;

Flow rate: 1.01 ml/min;

Column temperature: Room Temperature;

The wave length of determination: 286 nm.

STORAGE

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

REFERENCES

- [1] Kanno S I, Ai S, Hirata R, et al. J. Pharmacol. Sci., 2004, 75(92):166-70.
- [2] Bailey D G, Dresser G K, Leake B F, et al. Clin. Pharmacol. Ther., 2007, 81(4): 495-502.
- [3] Lee C H, Jeong T S, Choi Y K, et al. Biochem. Bioph. Res. Co., 2001, 284(3):681-8.
- [4] Jung U J, Lee M K, Jeong K S, et al. J. Nutr., 2004, 134(10):2499-503.
- [5] PAggarwal A, Gaur V A. Life Sci., 2010, 86(25-26):928-35.
- [6] Rajadurai M, Prince P S M. Toxicology, 2006, 228(2-3):259-68.
- [7] Li H, Yang B, Huang J, et al. Toxicol. Lett., 2013, 220(3):219-28.
- [8] Nie Y C, Wu H, Li P B, et al. Eur. J.Pharmacol., 2012, 690(1-3):207-13.
- [9] Jeon S M, Yong B P, Choi M S. Clin. Nutr., 2004, 23(5):1025-34.
- [10] Martin M J, Marhuenda E, Pérezguerrero C, et al. Pharmacology, 1994, 49(3):144-50.
- [11] Kumar A, Dogra S, Prakash A. J. Med. Food, 2010, 13(4):976-84.
- [12] Kandhare A D, Raygude K S, Ghosh P, et al. Fitoterapia, 2012, 83(4):650-9.
- [13] Wang P. Medicinal Plant, 2011(11):37-38, 53.



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

KAMPOYAKI HERS PTE LTD

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

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

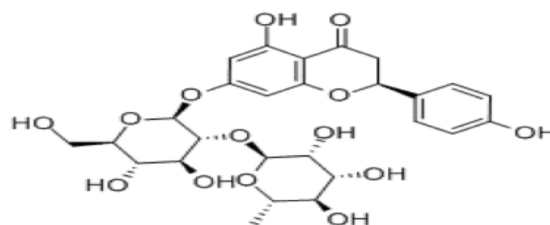
Web: www.kampoyaki-research.com

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

E-mail: kampoyak@singnet.com.sg

CERTIFICATE OF ANALYSIS

Name: Naringin
Catalog No.: KRN99555
Cas No.: 10236-47-2
Purity: $\geq 98\%$
M.F.: $C_{27}H_{32}O_{14}$



Physical Description: Yellow powder

Solvent: DMSO, Pyridine, Methanol, Ethanol, etc.

Weight 20 mg

Lot No. KRS201801

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 $^1\text{H-NMR}$, HPLC

Purity tested

Results

Consistent with the above structure

$\geq 98\%$



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

KAMPOYAKI HERS 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: Naringin

Product code: KRN99555

Company: KAMPOYAKI HERS 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: Naringin

CAS#: 10236-47-2

Purity: >=98%

Formula: C₂₇H₃₂O₁₄

Molecular Weight: 580.53

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 HERS 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