




1. Identification of the Preparation and of the Company	
1.1 Product Identifier:	Isomerized Kettle Extract
Synonyms:	IKE Pre-isomerized CO ₂ Extract Isomerized Resin Extract (IRE)
1.2 Relevant Uses	For use as an ingredient in the brewing of beer.
1.3 Supplier:	BarthHaas / BarthHaas UK Ltd.
1.4 Emergency Contact Details:	Hop Pocket Lane, Paddock Wood, Kent, TN12 6DQ, UK Emergency phone: +44 1892 833 415 (09:00 - 17:30 Mon-Thurs; 09:00 - 16:30 Fri, UK time) Email: enquiries@barthhaas.co.uk BarthHaas / John I. Haas, Inc. 1600 River Rd., Yakima, WA 98902, USA. Emergency phone: +1 202 777 4800 (office hours) Email: info@johnihaas.com Hopfenveredlung St. Johann GmbH Address: Auenstr. 18-20, 85283 Wolnzach, Germany Emergency phone: +49 8442 660 (office hours) Email: contact@nateco2.de
2. Hazards Identification	
2.1 Classification:	According to Regulation (EC) 1272/2008 [CLP]: Skin Irritation Category 2 Eye Irritation Category 2 Skin Sensitisation Category 1
2.2 Label Elements:	According to Regulation (EC) 1272/2008 [CLP]: <u>Hazard Pictogram:</u>  <u>Signal Word:</u> Warning <u>Hazard Statements:</u> H315: Causes skin irritation H317: May cause an allergic skin reaction H319: Causes serious eye irritation <u>Precautionary Statements:</u> P280: Wear protective gloves and eye protection P302+P352: IF ON SKIN: Wash with plenty of soap and water P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P333+P313: If skin irritation or rash occurs: Get medical advice/attention.
2.3 Other Hazards:	None

3. Components/Information on Ingredients

The product is a mixture of isomerized hop (*Humulus lupulus* L.) bitter acids (viz. iso-alpha acids or isohumulones), hop resins and essential oils. The isomerized bitter acid content varies according to the original hop variety extracted, but typically the range will be 40-60% iso-alpha acids. The CAS no. for iso-alpha-acid/isohumulone is 25522-96-7 and the EINECS no. is 247-072-1).

4. First Aid Measures

4.1 Description of First Aid Methods:	<p><u>Inhalation:</u> Move to fresh air.</p> <p><u>Skin Contact:</u> Wash skin thoroughly with soap and water. If any symptoms persist obtain medical attention.</p> <p><u>Eye Contact:</u> Flood the eye with plenty of water. If any symptoms persist obtain medical attention.</p> <p><u>Oral Ingestion:</u> Rinse mouth out with water and drink a portion of water (ca. 200ml). Vomiting may occur but should not be induced. Obtain medical attention if symptoms persist.</p>
4.2 Most Important Symptoms and Effects:	Skin and eye irritation
4.3 Indication of Immediate Medical Attention or Special Treatment:	Action as indicated in Section 4.1 above

5. Fire-Fighting Measures

5.1 Extinguishing media:	Carbon dioxide, dry powder and foam.
5.2 Special Hazards Arising from Substance:	Contains small amounts of hop oil. Hop oil is combustible and may give rise to hazardous fumes in a fire.
5.3 Advice for Firefighters:	Fire fighters should wear self-contained positive pressure breathing apparatus.

6. Accidental Release Measures

6.1 Personal Protection:	Wear appropriate protective clothing - see Section 8.
6.2 Environmental Precautions:	Avoid sub-soil penetration. Prevent entry to sewers and public waters. Do not discharge onto the ground or into watercourses.
6.3 Methods for Cleaning Up:	Contain spillage using earth, sand or other inert material. Transfer to suitable sealed container prior to disposal. Flush area with hot soapy water to remove final traces. Use adequate ventilation or a respirator if in a confined area.

7. Handling and Storage

7.1 Precautions for Safe Handling:	Avoid excessive contact with product. Use appropriate protective clothing as indicated in Section 8. Wash hands after use.
7.2 Conditions for Safe Storage:	Store at 15 - 25 °C (59 - 77 °F). Keep container closed when not in use. Use opened containers as soon as possible. Suitable storage is in glass, high density polyethylene, and high phenolic lacquered mild steel.
7.3 Specific End Uses:	The substance is manufactured for use as a food ingredient and for such uses is not subject to registration via REACH (Regulation (EC) No.1907/2006). It should be used in accordance with applicable food legislation.

8. Exposure Controls / Personal Protection

8.1 Control Parameters:	Not applicable.
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8.2 Exposure Controls:	<u>Engineering Controls:</u>	Provide adequate ventilation.
	<u>Eye/Face Protection:</u>	Chemical goggles must be worn during handling.
	<u>Hand Protection:</u>	PVC, rubber, latex or nitrile gloves.
	<u>Skin Protection:</u>	If danger of splashing wear PVC or rubber apron.
	<u>Respiratory Protection:</u>	Not normally required.

9. Physical and Chemical Properties

Appearance:	Viscous liquid, yellow/orange to brown/green
Odour:	Characteristic, resinous aroma
Odour Threshold:	No data available
pH:	No data available
Freezing Point:	No data available
Boiling Point:	>100 °C
Flash Point:	>60 °C
Evaporation Rate:	No data available
Flammability:	No data available
Upper/Lower Flammability:	No data available
Vapour Pressure:	No data available
Vapour Density:	No data available
Density:	850 - 1000 kg.m ⁻³
Solubility in Water:	Insoluble; forms an emulsion
Partition Coefficient:	No data available
Autoignition Temperature:	No data available
Decomposition Temperature:	No data available
Viscosity at 20 °C:	No data available
Explosive properties:	No data available
Oxidising properties:	No data available

10. Stability and Reactivity

10.1 Reactivity:	No reactivity hazards known
10.2 Chemical Stability:	Stable if stored in accordance with 7.2 and 10.5
10.3 Possibility of Hazardous Reactions:	None known
10.4 Conditions to Avoid:	Keep container closed when not in use
10.5 Incompatible Materials:	Unlined steel - Aluminum
10.6 Hazardous Decomposition Products:	None known

11. Toxicological Information

1.1 Information on Toxicological Effects:

No data available. Read-across from the starting material Hop extract (CAS 8060-28-4 EINECS N°. 232-504-3) is appropriate since IKE is Hop extract with α -acids isomerised to iso- α -acids. Toxicological assessment of Hop extract indicates that the toxicity of α -acids and iso- α -acids are similar. The data below is for Hop extract:

Long history of safe use as a beer ingredient.

(a) Acute toxicity:

Typical hop extracts are not classified as hazardous. Estimated ATE values (oral, dermal) are >2000 mg/kg bw.

Beta-acid enriched hop extracts containing 30 - 70% β -acids could potentially have an ATE value of 1,000 - 2,300 mg per kg bw. This would place certain extracts (>35% β -acids) under Category 4 for Acute Toxicity according to Regulation (EC) 1272/2008.

(b) Skin corrosion/irritation:

Skin Irritation Category 2.

(c) Serious eye damage/irritation:

Eye Irritation Category 2.

(d) Respiratory or skin sensitisation:

Skin Sensitisation Category 1.

(e) Germ cell mutagenicity:

OECD Guideline 471 (Bacterial Reverse Mutation Assay) not mutagenic.

Bacterial Reverse Mutation Assay on 40% β -acids: not mutagenic.

(f) Carcinogenicity:

Long history of safe use as a component of beer. Bacterial reverse mutation assay: not mutagenic.

(g) Reproductive toxicity:

Weight of evidence indicates lack of reproductive toxicity. Long history of safe use as a component of beer. Hop extracts are generally recognised as safe (GRAS) in accordance with US FDA regulation 21 CFR 182.20.

(h) STOT-single exposure:

Weight of evidence indicates safety when used for its intended use - see (g) above.

(a) STOT -repeated exposure:

Weight of evidence indicates safety when used for its intended use - see (g) above.

(b) Aspiration hazard

Not an aspiration hazard.

12. Ecological Information

No data available. Read-across from the starting material Hop extract (CAS 8060-28-4 EINECS N°. 232-504-3) is appropriate since IKE is Hop extract with α -acids isomerised to iso- α -acids. Ecotoxicological assessment of Hop extract and of the potassium salts of iso- α -acids did not conclude that either of these substances should be classified as hazardous to the environment. The data below is for Hop extract:

Toxicity to fish: *Carassius auratus* (goldfish) - Etude pharmacologique de l'action du lupulin et de la fleur d'organer sur le poisson. *Pharmaceutica acta Helvetiae* (1953) **28**(7-8), pp.183-206: lowest dose causing adverse effects estimated by calculation as ca. 80 mg/l.

Toxicity to Daphnia and other aquatic invertebrates:

EC50 - *Daphnia magna* (Water flea) - >5.8 mg/l - 48 h.

NOEC - *Daphnia magna* - ca. 2.2 mg/l - 48 h.

Toxicity to freshwater algae:

EC50 - 42.7 mg/l - 48 h.

NOEC - 12.5 mg/l - 72 h.

12.2 Persistence and degradability

Ultimate biodegradation (natural product).

12.3 Bioaccumulative potential

Natural product, not expected to bioaccumulate.

12.4 Mobility in soil

Log K_{oc} 1.7 - <4.5 (modelling by EPISuite™)

Other information: low hazardous to water

Water contaminant class 1 (self assessment) according to VwVwS from May 17th 1999 appendix 3. Do not discharge onto the ground or into watercourses.

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

No data.

13. Disposal Considerations

Product disposal:	Dispose in accordance with all applicable local and national regulations.
Container disposal:	Labels should not be removed from containers until they have been cleaned. Contaminated containers should not be treated as household waste. Containers should be cleaned using appropriate methods and then re-used or disposed of by landfill or incineration as appropriate.

14. Transport Information

UN-Number:	Non-hazardous for transport
Class:	Non-hazardous for transport
Shipping name:	N/A
Packing group:	Non-hazardous for transport
Marine pollutant:	No data available

15. Regulatory Information

15.1 Safety, Health and Environmental Regulations:	For food use. Germany: Water contaminant class 1 (self assessment) according to VwVwS from May 17 th 1999 appendix 3. Do not discharge onto the ground or into watercourses.
15.2 Chemical Safety Assessment:	No data available

16. Other Information

The information in this safety data sheet is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. The information in this document is based on our present knowledge and should be used only as a supplement to information already in your possession concerning this product. It does not represent any guarantee of the properties of the product. The determination of whether and under what condition the product should be used is yours to make. We do not accept any liability for loss, injury or damage that may result from its use.

(a) Key literature references and sources for data:

- REACH registration dossier for EC 232-504-3 and for EC 305-203-0