SAFETY DATA SHEET

1. Identification

Product identifier	**DIACETONE ACRYLAMIDE (DAAM)**
Other means of identification	
SDS number	10 - 12
CAS number	2873-97-4
Recommended use	Ink, polymeric materials, adhesive, detergent and paints.
Recommended restrictions	None known.
Manufacturer/Importer/Supplier/Distributor information	
Manufacturer	KH Neochem Co., Ltd. 2-3-1, Nihonbashi Muromachi, Chuo-ku, Tokyo, 103-0022, Japan
Telephone	+81-3-3510-3561
FAX	+81-3-3510-3571
Supplier	KH Neochem Americas, Inc. 1515 East Woodfield Road, Suite 710, Schaumburg, IL 60173
Telephone	(847) 517-8800
FAX	(847) 517-8830
Contact person	KH Neochem Co., Ltd.
Telephone	+81-3-3510-3561
Emergency number	
CHEMTREC	(800) 424-9300, 24 Hours Everyday
Non-Transportation	
KH Neochem Americas, Inc	(847) 517-8800, Central Standard Time, 9 am to 5 pm
KH Neochem Co., Ltd.	+81-3-3510-3561, Japan Standard Time, 9 am to 6 pm

2. Hazard(s) identification

Physical hazards	Not classified.	
Health hazards	Acute toxicity, oral	Category 4
	Specific target organ toxicity, single exposure	Category 2 (Liver)
OSHA defined hazards	Combustible dust	
Label elements		

Signal word	Warning
Hazard statement	May form combustible dust concentrations in air. Harmful if swallowed. May cause damage to organs (Liver).
Precautionary statement	
Prevention	Prevent dust accumulation to minimize explosion hazard. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Do not breathe dust/fume/gas/mist/vapors/spray. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Observe good industrial hygiene practices.
Response	If swallowed: Call a poison center/doctor if you feel unwell. Rinse mouth. If exposed or concerned: Call a poison center/doctor. Take off contaminated clothing and wash it before reuse. In case of fire: Use appropriate media to extinguish.
Storage	Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	None.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
N-(1,1-Dimethyl-3-oxobutyl)acrylamide		2873-97-4	> 98

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact Wash off with soap and water. Get medical attention if irritation develops and persists.

Eye contact Do not rub eyes. Rinse with water. Get medical attention if irritation develops and persists.

Ingestion Rinse mouth. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical advice/attention if you feel unwell.

Most important symptoms/effects, acute and delayed Dusts may irritate the respiratory tract, skin and eyes. Jaundice.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General information If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2). Apply extinguishing media carefully to avoid creating airborne dust. Avoid high pressure media which could cause the formation of a potentially explosible dust-air mixture.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical Explosion hazard: Avoid generating dust; fine dust dispersed in air in sufficient concentrations and in the presence of an ignition source is a potential dust explosion hazard. During fire, gases hazardous to health may be formed such as: Carbon monoxide and carbon dioxide. Nitrogen Oxides (NOx).

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions Move containers from fire area if you can do so without risk. Use water spray to cool unopened containers. Use standard firefighting procedures and consider the hazards of other involved materials. In case of fire and/or explosion do not breathe fumes.

General fire hazards May form combustible dust concentrations in air.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Use only non-sparking tools. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Wear appropriate protective equipment and clothing during clean-up. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up

Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Take precautionary measures against static discharge. Use only non-sparking tools. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Stop the flow of material, if this is without risk.

Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water.

Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal. Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions

Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling

Minimize dust generation and accumulation. Avoid significant deposits of material, especially on horizontal surfaces, which may become airborne and form combustible dust clouds and may contribute to secondary explosions. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Explosion-proof general and local exhaust ventilation. Do not taste or swallow. When using, do not eat, drink or smoke. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Store locked up. Keep containers tightly closed in a dry, cool and well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

No exposure limits noted for ingredient(s).

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Explosion-proof general and local exhaust ventilation. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen-deficient environment. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment). Use only appropriately classified electrical equipment and powered industrial trucks.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear safety glasses with side shields (or goggles).

Skin protection

Hand protection

Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

Skin protection

Other

Wear suitable protective clothing. Use of an impervious apron is recommended.

Respiratory protection

If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations

When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Physical state

Solid.

Form

Yellowish solid.

Color

Yellowish.

Odor

Not available.

Odor threshold	Not available.
pH	Not applicable.
Melting point/freezing point	129.2 °F (54 °C)
Initial boiling point and boiling range	248 °F (120 °C) (1.1 kPa)
Flash point	258.8 °F (126.0 °C) Open Cup
Evaporation rate	Not applicable.
Flammability (solid, gas)	Combustible dust.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Vapor pressure	0.59 kPa (4.4 mmHg) (68 °F (20 °C))
Vapor density	Not available.
Relative density	0.998 (60/4 °C)
Solubility(ies)	
Solubility (water)	> 100g/ 100g (25°C)
Solubility (other)	Soluble in commonly used organic solvents.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available. (140 °F (60 °C)) 17.9 mPa·s (104 °F (40 °C))
Other information	
Explosive properties	Lower Explosion Limit > 1000 mg/l (Flake)(Hartmann tube dust explosion test) Minimum Ignition Energy 42.3mJ (Flake) (VDI2263)
Molecular weight	169.2 g/mol
Oxidizing properties	Not oxidizing.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions. The substance is hygroscopic and will absorb water by contact with the moisture in the air.
Possibility of hazardous reactions	May occur.
Conditions to avoid	Keep away from heat, sparks and open flame. Contact with incompatible materials. Minimize dust generation and accumulation.
Incompatible materials	Peroxides. Strong bases. Strong acids.
Hazardous decomposition products	Carbon monoxide. Carbon dioxide. Nitrogen oxides.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Dust may irritate respiratory system.
Skin contact	Prolonged skin contact may cause irritation.
Eye contact	Dust may irritate the eyes.
Ingestion	Harmful if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics	Dusts may irritate the respiratory tract, skin and eyes. Jaundice.

Information on toxicological effects

Acute toxicity	Harmful if swallowed.

Product	Species	Test Results
N-(1,1-Dimethyl-3-oxobutyl)acrylamide (CAS 2873-97-4)		
Acute		
Dermal		
LD50	Rabbit	> 10000 mg/kg
Oral		
LD50	Rat	1610 mg/kg (OECD TG 401, GLP)

Skin corrosion/irritation Prolonged skin contact may cause redness, irritation and dry skin.

Serious eye damage/eye irritation Dust may irritate the eyes.

Respiratory or skin sensitization

Respiratory sensitization No data available.

Skin sensitization No data available.

Germ cell mutagenicity Classification not possible.

Germ cell mutagenicity: Ames test
Result: Negative

Carcinogenicity No data available.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

NTP Report on Carcinogens

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

Reproductive toxicity No data available.

Specific target organ toxicity - single exposure May cause damage to organs (Liver). LOAEL (Oral, rat, 4hr): 1414 mg/kg. (OECD TG 401, GLP)

Specific target organ toxicity - repeated exposure No data available.

Aspiration hazard No data available.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Product		Species	Test Results
N-(1,1-Dimethyl-3-oxobutyl)acrylamide (CAS 2873-97-4)			
Aquatic			
Algae	EC50	Desmodesmus subspicatus	> 100 mg/l, 72 Hours (Growth rate, OECD TG 201, GLP)
	NOEC	Desmodesmus subspicatus	100 mg/l, 72 Hours (Growth rate, OECD TG 201, GLP)
Crustacea	EC50	Daphnia magna	> 100 mg/l, 48 Hours (OECD TG 202, GLP)
	NOEC	Daphnia magna	100 mg/l, 48 Hours (OECD TG 202, GLP)
Fish	LC50	Oryzias latipes	1501 mg/l, 96 Hours

Persistence and degradability The product is readily biodegradable. BOD: > 94.3% / 28 days (OECD TG 301E, GLP)

Bioaccumulative potential No data available on bioaccumulation.

Mobility in soil The product is water soluble and may spread in water systems.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.

15. Regulatory information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

Toxic Substances Control Act (TSCA)	This substance is on the TSCA 8(b) inventory and is designated “active”.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical	Yes
Classified hazard categories	Combustible dust Acute toxicity (any route of exposure) Specific target organ toxicity (single or repeated exposure)

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)	Not regulated.

US state regulations

US. Massachusetts RTK - Substance List

Not regulated.

US. New Jersey Worker and Community Right-to-Know Act

Not listed.

US. Pennsylvania Worker and Community Right-to-Know Law

Not listed.

US. Rhode Island RTK

Not regulated.

California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	Yes
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 21-November-2013

Revision date 20-May-2022

Version # 04.01

Further information

Refer to:
OSHA 3371-08 2009, Hazard Communication Guidance for Combustible Dusts
NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids
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HMIS® ratings

Health: 1
Flammability: 1
Physical hazard: 0

NFPA ratings

List of abbreviations

DOT: Department of Transportation.
EC50: Effective Concentration, 50%.
IATA: International Air Transport Association.
IBC Code: International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.
IMDG: International Maritime Dangerous Goods.
LC50: Lethal Concentration, 50%.
LD50: Lethal Dose, 50%.
LOAEL: Low Observed Adverse Effect Level.
MARPOL: International Convention for the Prevention of Pollution from Ships.
NOEC: No observed effect concentration.

References

1) NIOSH, Registry of Toxic Effects of Chemical Substances (RTECS, AS3475000)
2) Hazardous Substances Data Bank (HSDB, CAS No. 2873-97-4)
3) K. Hashimoto and H. Tanii, Mutation Research, 158, 129-133 (1985)
4) KH Neochem Co., Ltd. Unpublished data; The Chemicals Evaluation and Research Institute, Japan, Kurume laboratory, N-(1,1-DIMETHYL-3-OXOBUTYL)ACRYLAMIDE: Acute toxicity to Oryzias latipes in a 96-hour static test, No. N01-0065 (1988).
5) KH Neochem Co., Ltd. Unpublished data; SafePharm Laboratories Ltd., Diacetone Acrylamide (DAAM): ACUTE TOXICITY TO DAPHNIA MAGNA、SPL PROJECT NUMBER: 0732/0156 (2007)
6) KH Neochem Co., Ltd. Unpublished data; SafePharm Laboratories Ltd., Diacetone Acrylamide (DAAM): ALGAL GROWTH INHIBITION TEST, SPL PROJECT NUMBER: 0732/0155 (2007)
7) KH Neochem Co., Ltd. Unpublished data; Harlan Laboratories Ltd., DAAM: DETERMINATION OF HAZARDOUS PHYSICO-CHEMICAL PROPERTIES, PROJECT NUMBER: 0732/0181 (2011)
8) KH Neochem Co., Ltd. Unpublished data; Japan Carlit Co., Ltd. Material Hazard Laboratory., Hazard evaluation test report (Sept. 2007).
9) KH Neochem Co., Ltd. Unpublished data; SafePharm Laboratories Ltd., DAAM: ACUTE ORAL TOXICITY TEST IN THE RAT, PROJECT NUMBER: 732/1 (1994)
10) KH Neochem Co., Ltd. Unpublished data; The Chemicals Evaluation and Research Institute, Japan, Kurume laboratory, Biodegradation test, No. 32850 (1988)

Disclaimer

The information contained herein is based on documents and data available as of the date issued and may be revised based on new knowledge. Numerical values such as the content or the physicochemical properties are not the guaranteed values. Precaution statements described herein are intended for normal use of the product, and it is the user's responsibility to take safety measures appropriate for the specific application and use of the product. In addition, the description is intended to provide information and not to guarantee the contents; therefore, it is recommended to review references and source data or conduct preliminary tests for important decisions in advance.