

# SAFETY DATA SHEETS

According to Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Sixth revised edition

Version: 1.0

Creation Date: Aug 12, 2017

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## 1. Identification

### 1.1 GHS Product identifier

Product name            9H-carbazole

### 1.2 Other means of identification

Product number        -

Other names            diphenylenimine

### 1.3 Recommended use of the chemical and restrictions on use

Identified uses        For industry use only.

Uses advised against   no data available

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## 2. Hazard identification

### 2.1 Classification of the substance or mixture

Not classified.

### 2.2 GHS label elements, including precautionary statements

Pictogram(s)            No symbol.

Signal word              No signal word.

Hazard statement(s)    none

Precautionary  
statement(s)

Prevention                none

Response	none
Storage	none
Disposal	none

## 2.3 Other hazards which do not result in classification

none

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## 3. Composition/information on ingredients

### 3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
9H-carbazole	9H-carbazole	86-74-8	none	100%

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## 4. First-aid measures

### 4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

### 4.2 Most important symptoms/effects, acute and delayed

**SYMPTOMS:** Symptoms of exposure to this compound may include irritation. It may cause allergic reactions. It may also cause dermatitis, bronchitis, coughing, dyspnea and respiratory distress. **ACUTE/CHRONIC HAZARDS:** This compound may be harmful by ingestion, inhalation and skin absorption. It may cause irritation. When heated to decomposition it emits toxic fumes of carbon monoxide, carbon dioxide and nitrogen oxides.

#### 4.3 Indication of immediate medical attention and special treatment needed, if necessary

no data available

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### 5. Fire-fighting measures

#### 5.1 Extinguishing media

Suitable extinguishing media

Fires involving this material can be controlled with a dry chemical, carbon dioxide or Halon extinguisher. A water spray may also be used.

#### 5.2 Specific hazards arising from the chemical

Flash point data for this chemical are not available; however, it is probably combustible.

#### 5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

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### 6. Accidental release measures

#### 6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

#### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

#### 6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal. Sweep up and shovel. Keep in suitable, closed containers for disposal.

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## 7. Handling and storage

### 7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

### 7.2 Conditions for safe storage, including any incompatibilities

MATERIALS WHICH ARE TOXIC AS STORED OR WHICH CAN DECOMPOSE INTO TOXIC COMPONENTS ... SHOULD BE STORED IN A COOL WELL VENTILATED PLACE, OUT OF THE DIRECT RAYS OF THE SUN, AWAY FROM AREAS OF HIGH FIRE HAZARD, & SHOULD BE PERIODICALLY INSPECTED. INCOMPATIBLE MATERIALS SHOULD BE ISOLATED ... .

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## 8. Exposure controls/personal protection

### 8.1 Control parameters

Occupational Exposure limit values

no data available

Biological limit values

no data available

### 8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

### 8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

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## 9. Physical and chemical properties

Physical state	white crystals or light brown powder
Colour	CRYSTALS FROM ALCOHOL, BENZENE, TOLUENE, GLACIAL ACETIC ACID
Odour	no data available
Melting point/ freezing point	-56°C(lit.)
Boiling point or initial boiling point and boiling range	215°C(lit.)
Flammability	no data available
Lower and upper explosion limit / flammability limit	no data available
Flash point	94°C(lit.)
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	EXTREMELY WEAK BASE
Kinematic viscosity	no data available
Solubility	less than 1 mg/mL at 18.89°C
Partition coefficient n-octanol/water (log value)	no data available

Vapour pressure 400 mm Hg ( 323 °C)

Density and/or relative density 1.1

Relative vapour density no data available

Particle characteristics no data available

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## 10. Stability and reactivity

### 10.1 Reactivity

no data available

### 10.2 Chemical stability

Stable under recommended storage conditions.

### 10.3 Possibility of hazardous reactions

CARBAZOLE is an extremely weak base. It is incompatible with strong oxidizing agents. It reacts with nitrogen oxides. Potassium hydroxide fusion yields a salt.

### 10.4 Conditions to avoid

no data available

### 10.5 Incompatible materials

no data available

### 10.6 Hazardous decomposition products

When heated to decomposition it emits toxic fumes of /nitrogen oxides/.

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## 11. Toxicological information

Acute toxicity

- Oral: no data available
- Inhalation: no data available
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Evaluation: No epidemiological data relevant to the carcinogenicity of carbazole were available. There is limited evidence in experimental animals for the carcinogenicity of carbazole. Overall evaluation: Carbazole is not classifiable as to its carcinogenicity to humans (Group 3).

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

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## 12. Ecological information

### 12.1 Toxicity

- Toxicity to fish: no data available
- Toxicity to daphnia and other aquatic invertebrates: no data available
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

### 12.2 Persistence and degradability

Based on measured biodegradation rates of 2.7-9.7 1/hr from batch fermentation screening studies using sewage inocula and 700-800 ppm carbazole, half-lives of 4.3 min-6.2 hr can be estimated for carbazole(1). After 14

days of incubation at 30°C, indigenous microorganisms removed 66% of carbazole (initial concn of 2.9 ug/ml) from contaminated groundwater taken from the American Creosote Works Superfund site, Pensacola, FL(2). Levels of indigenous carbazole mineralization varied from 0 to 46% after 60 days in mineralization experiments using C14 labeled carbazole in 3 southern Illinois soils(3). In the same experiment, the carbazole-degrading bacterium, Xanthomonas sp., was reintroduced and enhanced mineralization to 45% after 7 days in a soil where little indigenous mineralization occurred(3). Carbazole initial concns of 500 and 5 ppm did not degrade after 90 and 15 days, respectively, in Chernozem loamy soil at 19°C based on thin layer chromatography(4).

### 12.3 Bioaccumulative potential

Based on static bioconcentration experiments with guppies (*Poecilia reticulata*), the log bioconcentration factor (log BCF) was determined to be 2.7 for carbazole(2). Log BCFs for carbazole in alga (*Oedogonium cardiacum*), snail (*Physa* sp.), mosquito larvae (*Culex pepiens*), and mosquito fish (*Gambusia affinis*) were measured to be 1.69, 2.13, 2.05, and 2.10, respectively; however, carbazole was metabolized to N-methyl and N-acetyl derivatives(1). The log BCF for carbazole in *Daphnia pulex* was experimentally determined to be 2.06(3).

### 12.4 Mobility in soil

Based on an experimental Koc range of 114 to 1180, the average Koc value in 21 soils has been determined to be 637(1). According to a suggested classification scheme(2), this Koc value suggests that carbazole will have low mobility in soil. In CA-Montmorillonite soil (0.06 % organic content) and Coyote Creek sediment (1.4% organic content), Koc values of 5300 and 12500 were measured for carbazole(3). Furthermore, sorption of carbazole to soil is nonlinear and highly correlated with organic content of soils; hence, mobility of carbazole in groundwater containing low organic content may be more than expected from estimated Koc values(1) based on the measured log Kow of 3.72(4) and water solubility of 1.8 mg/l at 25°C(5).

### 12.5 Other adverse effects

no data available

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## 13. Disposal considerations

### 13.1 Disposal methods

Product



The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

#### Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

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## 14. Transport information

### 14.1 UN Number

ADR/RID: UN3077

IMDG: UN3077

IATA: UN3077

### 14.2 UN Proper Shipping Name

ADR/RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

IATA: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

### 14.3 Transport hazard class(es)

ADR/RID: 9

IMDG: 9

IATA: 9

### 14.4 Packing group, if applicable

ADR/RID: III

IMDG: III

IATA: III

### 14.5 Environmental hazards

ADR/RID: no

IMDG: no

IATA: no

### 14.6 Special precautions for user

no data available

### 14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

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## 15. Regulatory information

## 15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
9H-carbazole	9H-carbazole	86-74-8	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

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## 16. Other information

### Information on revision

Creation Date            Aug 12, 2017

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### Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

## References

- IPCS - The International Chemical Safety Cards (ICSC), website:  
<http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website:  
<https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website:  
<http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website:  
[http://www.echemportal.org/echemportal/index?pageID=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en)
- CAMEO Chemicals, website:  
<http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website:  
<http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website:  
<http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

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Disclaimer: The above information 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 the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. We as supplier shall not be held liable for any damage resulting from handling or from contact with the above product.