Safety Data Sheet
Irgacure® 651

1. Identification

Product identifier used on the label

Irgacure® 651

Recommended use of the chemical and restriction on use

Recommended use*: photoinitiator

* The “Recommended use” identified for this product is provided solely to comply with a Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

Details of the supplier of the safety data sheet

Company:
BASF CORPORATION
100 Park Avenue
Florham Park, NJ 07932, USA

Telephone: +1 973 245-6000

Emergency telephone number

CHEMTREC: 1-800-424-9300
BASF HOTLINE: 1-800-832-HELP (4357)

Other means of identification

Chemical family: photoinitiator

2. Hazards Identification


Classification of the product

<table>
<thead>
<tr>
<th>Aquatic Acute</th>
<th>Aquatic Chronic</th>
<th>Combustible Dust</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Combustible Dust (1)</td>
</tr>
</tbody>
</table>

Hazardous to the aquatic environment - acute
Hazardous to the aquatic environment - chronic
Combustible Dust

Label elements

Pictogram:
Signal Word:
Warning

Hazard Statement:
May form combustible dust concentration in air.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary Statements (Prevention):
P273 Avoid release to the environment.

Precautionary Statements (Response):
P391 Collect spillage.

Precautionary Statements (Disposal):
P501 Dispose of contents/container to hazardous or special waste collection point.

Hazards not otherwise classified

The product is under certain conditions capable of dust explosion.


Emergency overview

CAUTION:
The substance is photo-sensitizing.
May cause slight irritation to the skin.
May cause slight irritation to the eyes.
Chronic exposure may cause liver and kidney damage.
Avoid skin contact.
The statements are based on the properties of the individual components.
Refer to MSDS Section 7 for Dust Explosion information.

3. Composition / Information on Ingredients


<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Content (W/W)</th>
<th>Chemical name</th>
</tr>
</thead>
<tbody>
<tr>
<td>24650-42-8</td>
<td>&gt;= 75.0 - &lt;= 100.0%</td>
<td>2,2-dimethoxy-1,2-diphenyl ethan-1-one</td>
</tr>
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</table>
4. First-Aid Measures

Description of first aid measures

General advice:
Remove contaminated clothing.

If inhaled:
If difficulties occur after dust has been inhaled, remove to fresh air and seek medical attention.

If on skin:
Wash thoroughly with soap and water. If irritation develops, seek medical attention.

If in eyes:
Wash affected eyes for at least 15 minutes under running water with eyelids held open. If irritation develops, seek medical attention.

If swallowed:
Rinse mouth and then drink plenty of water. Do not induce vomiting. Seek medical attention if necessary.

Most important symptoms and effects, both acute and delayed

Symptoms: The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11. Further important symptoms and effects are so far not known.

Indication of any immediate medical attention and special treatment needed

Note to physician
Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
dry powder, foam

Unsuitable extinguishing media for safety reasons:
carbon dioxide

Additional information:
Avoid whirling up the material/product because of the danger of dust explosion.

Special hazards arising from the substance or mixture
Hazards during fire-fighting:
harmful vapours
Evolution of fumes/fog. The substances/groups of substances mentioned can be released in case of fire.

Advice for fire-fighters
Protective equipment for fire-fighting:
Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:
Dusty conditions may ignite explosively in the presence of an ignition source causing flash fire.

Impact Sensitivity:
Assessment: Product is not explosive when subjected to mechanical impact.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Use personal protective clothing.

Environmental precautions
Contain contaminated water/firefighting water. Do not discharge into drains/surface waters/groundwater.

Methods and material for containment and cleaning up
For small amounts: Pick up with suitable appliance and dispose of.
For large amounts: Contain with dust binding material and dispose of.
Avoid raising dust.

7. Handling and Storage

Precautions for safe handling
Breathing must be protected when large quantities are decanted without local exhaust ventilation.

Closed containers should only be opened in well-ventilated areas.

Protection against fire and explosion:
Avoid dust formation. Take precautionary measures against static discharges.

Dust explosion class: Dust explosion class 3 (Kst-value >300 bar m s⁻¹).

Conditions for safe storage, including any incompatibilities
Further information on storage conditions: Keep container tightly closed and dry; store in a cool place. Protect against heat. Protect from direct sunlight. Keep only in the original container.

8. Exposure Controls/Personal Protection

Personal protective equipment
Respiratory protection:
Wear a NIOSH-certified (or equivalent) organic vapour/particulate respirator.


Hand protection:
Chemical resistant protective gloves
Eye protection:
Safety glasses with side-shields. Wear face shield if splashing hazard exists.

9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form:</td>
<td>powder</td>
</tr>
<tr>
<td>Odour:</td>
<td>characteristic</td>
</tr>
<tr>
<td>Odour threshold:</td>
<td>not determined</td>
</tr>
<tr>
<td>Colour:</td>
<td>white to cream</td>
</tr>
<tr>
<td>pH value:</td>
<td>6.5</td>
</tr>
<tr>
<td>Melting temperature:</td>
<td>63 - 67 °C</td>
</tr>
<tr>
<td>Boiling point:</td>
<td>&gt; 190 °C</td>
</tr>
<tr>
<td>Flash point:</td>
<td>&gt; 190 °C</td>
</tr>
<tr>
<td>Flammability:</td>
<td>not highly flammable</td>
</tr>
<tr>
<td>Lower explosion limit:</td>
<td>For solids not relevant for classification and labelling.</td>
</tr>
<tr>
<td>Upper explosion limit:</td>
<td>For solids not relevant for classification and labelling.</td>
</tr>
<tr>
<td>Autoignition:</td>
<td>370 °C (BAM)</td>
</tr>
<tr>
<td>Vapour pressure:</td>
<td>0.001133 Pa</td>
</tr>
<tr>
<td>Density:</td>
<td>1.21 g/cm³</td>
</tr>
<tr>
<td>Relative density:</td>
<td>approx. 1.21</td>
</tr>
<tr>
<td>Bulk density:</td>
<td>1.210 kg/m³</td>
</tr>
<tr>
<td>Vapour density:</td>
<td>The product is a non-volatile solid.</td>
</tr>
<tr>
<td>Partitioning coefficient n-octanol/water (log Pow):</td>
<td>3.42</td>
</tr>
<tr>
<td>Self-ignition temperature:</td>
<td>380 °C</td>
</tr>
<tr>
<td>Thermal decomposition:</td>
<td>&gt; 300 °C</td>
</tr>
<tr>
<td>Viscosity, dynamic:</td>
<td>not applicable</td>
</tr>
<tr>
<td>Particle size:</td>
<td>No data available.</td>
</tr>
<tr>
<td>% volatiles:</td>
<td>not determined</td>
</tr>
<tr>
<td>Solubility in water:</td>
<td>(20 °C)</td>
</tr>
<tr>
<td>Solubility (quantitative):</td>
<td>No data available.</td>
</tr>
<tr>
<td>Molar mass:</td>
<td>256.30 g/mol</td>
</tr>
<tr>
<td>Evaporation rate:</td>
<td>The product is a non-volatile solid.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. Stability and Reactivity

Reactivity
No hazardous reactions if stored and handled as prescribed/indicated.

Oxidizing properties:
Based on its structural properties the product is not classified as oxidizing.

Dust explosion class:
Dust explosion class 3 (Kst-value >300 bar m s⁻¹) (St 3)

Minimum ignition energy:
The product is capable of dust explosion.
Chemical stability
The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions
Dust explosion hazard.

Conditions to avoid
Avoid dust formation. Avoid deposition of dust. Avoid sources of ignition. Avoid electro-static discharge.

Incompatible materials
strong oxidizing agents, strong bases, strong acids

Hazardous decomposition products
Decomposition products:
Hazardous decomposition products: No hazardous decomposition products if stored and handled as prescribed/indicated.

Thermal decomposition:
> 300 °C

11. Toxicological information

Primary routes of exposure
Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Primary routes of entry
Inhalation.
Skin
Eyes
Ingestion.

Acute Toxicity/Effects

Acute toxicity
Assessment of acute toxicity: Virtually nontoxic after a single ingestion. Virtually nontoxic after a single skin contact.

Oral
Type of value: LD50
Species: rat (male/female)
Value: > 5,000 mg/kg

Inhalation
Type of value: LC50
not determined

Dermal
Type of value: LD50
Species: rat (male/female)
Value: > 5,000 mg/kg
Assessment other acute effects
Assessment of STOT single:
Based on the available information there is no specific target organ toxicity to be expected after a single exposure.

Irritation / corrosion
Assessment of irritating effects: May cause slight irritation to the skin. May cause slight irritation to the eyes.

Skin
Species: rabbit
Result: non-irritant
Method: Draize test

Eye
Species: rabbit
Result: non-irritant
Method: OECD Guideline 405

Sensitization
Assessment of sensitization: Skin sensitizing effects were not observed in animal studies. The substance did not cause skin sensitization in humans.

Maurer optimisation test
Species: guinea pig
Result: Non-sensitizing.

Patch-Test
Species: human
Result: Non-sensitizing.

Aspiration Hazard
No aspiration hazard expected.

Chronic Toxicity/Effects

Repeated dose toxicity
Assessment of repeated dose toxicity: The substance may cause damage to the liver after repeated ingestion of high doses, as shown in animal studies. The substance may cause damage to the kidney after repeated ingestion of high doses, as shown in animal studies.

Genetic toxicity
Assessment of mutagenicity: The substance was not mutagenic in bacteria.

Carcinogenicity
Assessment of carcinogenicity: None of the components in this product at concentrations greater than 0.1% are listed by IARC; NTP, OSHA or ACGIH as a carcinogen.

Reproductive toxicity
Assessment of reproduction toxicity: Repeated oral uptake of the substance did not cause damage to the reproductive organs.

Other Information
(Guinea Pigs) Photoallergy: Positive photo-sensitization response seen. (Mice) Phototoxicity: Not a photo-irritant.
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Symptoms of Exposure

The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11. Further important symptoms and effects are so far not known.

12. Ecological Information

Toxicity

Aquatic toxicity
Assessment of aquatic toxicity:
Very toxic (acute effect) to aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish
LC50 (96 h) 6 mg/l, Lepomis macrochirus (See user defined text.)
The product has low solubility in the test medium. An eluate has been tested. The details of the toxic effect relate to the nominal concentration.

Aquatic invertebrates
EC50 (24 h) 26 mg/l, Daphnia magna (OECD Guideline 202, part 1, static)
The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested. The details of the toxic effect relate to the nominal concentration.

Aquatic plants
EC50 (72 h) 0.17 mg/l (growth rate), Desmodesmus subspicatus (See user defined text., static)
The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested. The details of the toxic effect relate to the nominal concentration.

Chronic toxicity to fish
No data available.

Chronic toxicity to aquatic invertebrates
No data available.

Microorganisms/Effect on activated sludge

Toxicity to microorganisms
OECD Guideline 209 static
activated sludge, domestic, non-adapted/EC50 (3 h): > 100 mg/l

Persistence and degradability

Assessment biodegradation and elimination (H2O)
Not readily biodegradable (by OECD criteria). Poorly biodegradable.

Elimination information

3 % CO2 formation relative to the theoretical value (28 d) (OECD 301B; ISO 9439; 92/69/EEC, C.4-C) (aerobic, activated sludge, domestic, non-adapted)

Bioaccumulative potential

Assessment bioaccumulation potential
Does not significantly accumulate in organisms.
Bioaccumulation potential
Bioconcentration factor: 43.04 (60 d)

Mobility in soil

Assessment transport between environmental compartments
The substance will not evaporate into the atmosphere from the water surface.
Adsorption to solid soil phase is possible.

Additional information

Other ecotoxicological advice:
Do not discharge product into the environment without control.

13. Disposal considerations

Waste disposal of substance:
Do not discharge into drains/surface waters/groundwater. Dispose of in accordance with national, state and local regulations.

Container disposal:
Dispose of in accordance with national, state and local regulations. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

14. Transport Information

Land transport
USDOT

Not classified as a dangerous good under transport regulations

Sea transport
IMDG
Hazard class: 9
Packing group: III
ID number: UN 3077
Hazard label: 9, EHSM
Marine pollutant: YES
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (contains BENZYLDIMETHYLKETAL)

Air transport
IATA/ICAO
Hazard class: 9
Packing group: III
ID number: UN 3077
Hazard label: 9, EHSM
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (contains BENZYLDIMETHYLKETAL)

15. Regulatory Information

VOC content:
not determined

**Federal Regulations**

**Registration status:**
Chemical TSCA, US released / listed

**EPCRA 311/312 (Hazard categories):** Fire (Combustible Dust);

**NFPA Hazard codes:**
Health : 2 Fire: 1 Reactivity: 0 Special:

**HMIS III rating**
Health: 2 Flammability: 1 Physical hazard:0

**16. Other Information**

**SDS Prepared by:**
BASF NA Product Regulations
SDS Prepared on: 2015/04/30

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