SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier
Product number 697316
Product name AZ 5214 E Photoresist

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses Materials for use in technical applications

1.3 Details of the supplier of the safety data sheet
Company Merck KGaA * 64271 Darmstadt * Germany * Phone:+49 6151 72-0
Responsible Department PM-OQR * e-mail: PM_SDS_Supply@merckgroup.com

1.4 Emergency telephone number
Please contact the regional company representation in your country.

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
Classification (REGULATION (EC) No 1272/2008)
Flammable liquids, Category 3 H226: Flammable liquid and vapour.
Specific target organ toxicity - single exposure, Category 3, Central nervous system H336: May cause drowsiness or dizziness. Calculation method

2.2 Label elements
Labelling (REGULATION (EC) No 1272/2008)
Hazard pictograms : Flammable liquid and vapour. Danger: May cause drowsiness or dizziness.
Signal word : Warning
Hazard statements : H226 Flammable liquid and vapour. H336 May cause drowsiness or dizziness.
Precautionary statements : Prevention: P210 Keep away from heat.

Hazardous components which must be listed on the label:
The Safety Data Sheets for catalogue items are available at www.merck-performance-materials.com
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

AZ 5214 E Photoresist

Version: 2.0  Product number: 697316  Revision Date: 18.05.2018
Print Date: 19.05.2018

2.3 Other hazards
None known.

SECTION 3: Composition/information on ingredients

Chemical nature : Organic mixture in: solvent

3.1 Substance
Not applicable

3.2 Mixtures

Hazardous components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No. Registration number</th>
<th>Classification</th>
<th>Concentration (% w/w)</th>
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</thead>
<tbody>
<tr>
<td>3,5-Bis(hydroxymethyl)-p-cresol</td>
<td>91-04-3</td>
<td>Skin Irr. 2; H315</td>
<td>&gt;= 1 - &lt; 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eye Irrit. 2; H319</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>STOT SE 3; H335</td>
<td></td>
</tr>
<tr>
<td>2-Methoxypropyl acetate-1</td>
<td>70657-70-4</td>
<td>Flam. Liq. 3; H226</td>
<td>&gt;= 0,1 - &lt; 0,3</td>
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<tr>
<td></td>
<td></td>
<td>Repr. 1B; H360D</td>
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<tr>
<td></td>
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<td>STOT SE 3; H335</td>
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<tr>
<td>Substances with a workplace exposure limit</td>
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<tr>
<td>2-methoxy-1-methylethyl acetate</td>
<td>108-65-6 01-2119475791-29-xxxx</td>
<td>Flam. Liq. 3; H226</td>
<td>&gt;= 50 - &lt;= 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STOT SE 3; H336</td>
<td></td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

4.1 Description of first aid measures

If inhaled : fresh air. Call in physician.

In case of skin contact : rinse out with polyethylene glycol 400 or a mixture of polyethylene glycol 300/ethanol 2:1 and wash with plenty of water. If neither is available wash with plenty of water. Immediately take off contaminated clothing. Seek medical advice immediately.

In case of eye contact : rinse out with plenty of water.
Remove contact lenses.

If swallowed: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms:
- Somnolence
- Drowsiness
- Headache
- Narcosis

4.3 Indication of any immediate medical attention and special treatment needed

Treatment: No information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media:
- Water
- Foam
- Carbon dioxide (CO2)
- Dry powder

Unsuitable extinguishing media:
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting:
- Combustible.

In case of fire hazardous decomposition products may be produced such as:
- Nitrogen oxides (NOx)
- Sulphur oxides

Vapours are heavier than air and may spread along floors. Forms explosive mixtures with air at elevated temperatures. Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters

Special protective equipment for firefighters:
- Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information:
- Cool closed containers exposed to fire with water spray. Prevent fire extinguishing water from contaminating surface water or the ground water system.
SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions: Advice for non-emergency personnel:
- Do not breathe vapours, aerosols.
- Avoid substance contact.
- Ensure adequate ventilation.
- Keep away from heat and sources of ignition.
- Evacuate the danger area, observe emergency procedures, consult an expert.
- Advice for emergency responders:
  - Protective equipment see section 8.

6.2 Environmental precautions

Environmental precautions: Do not flush into surface water or sanitary sewer system.
- Risk of explosion.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up: Cover drains. Collect, bind, and pump off spills.
- Observe possible material restrictions (see sections 7 and 10).
- Take up with liquid-absorbent material (e.g. Chemizorb®).
- Dispose of properly. Clean up affected area.

6.4 Reference to other sections

Indications about waste treatment see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling: Provide sufficient air exchange and/or exhaust in work rooms.
- Do not inhale substance/mixture.
- Avoid generation of vapours/aerosols.
- Observe label precautions.

Advice on protection against fire and explosion: Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

Hygiene measures: Change contaminated clothing. Wash hands after working with substance.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers: Store in original container.

Further information on storage conditions: Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.
Protected from light.

Risks from decomposition products: see section 10.3

Recommended storage temperature: Recommended storage temperature see product label.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

8.2 Exposure controls

Engineering measures
Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

Personal protective equipment
Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled and must meet the specifications of a standard EN/ISO/DIN. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Eye protection: Safety glasses

Hand protection:

  splash contact

Glove material: Nitrile rubber

Glove thickness: 0.4 mm

Break through time: > 10 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example: KCL 730 Camatril® - Velours (splash contact);. This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Protective measures: Flame retardant antistatic protective clothing.

Recommended Filter type: ABEK-filter
Respiratory protection : required when vapours/aerosols are generated.

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Environmental exposure controls
General advice : Do not flush into surface water or sanitary sewer system. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form liquid

Colour yellow
to red

Odour ester-like

Odour Threshold No information available.

pH Not applicable

Melting point No information available.

Boiling point/boiling range from 145 °C

Flash point approximately 42 °C Method: DIN 51755 Part 1

Evaporation rate No information available.

Flammability (solid, gas) No information available.

Lower explosion limit No information available.

Upper explosion limit No information available.

Vapour pressure approximately 5 mbar at 20 °C

Relative vapour density No information available.

Density approximately 1 g/cm3 at 20 °C

Solubility(ies) No information available.

Water solubility partly soluble - phase separation
SECTION 10: Stability and reactivity

10.1 Reactivity
Vapour/air-mixtures are explosive at intense warming.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions
Hazardous reactions: Risk of ignition or formation of inflammable gases or vapours with:
- Oxidizing agents
- Violent reactions possible with:
  - alkalines
  - Peroxides
  - Strong oxidizing agents

10.4 Conditions to avoid
Conditions to avoid: Heating.

10.5 Incompatible materials
Materials to avoid: no information available

10.6 Hazardous decomposition products
in the event of fire: See section 5.

SECTION 11: Toxicological information
11.1 Information on toxicological effects

**Acute toxicity**

**Product:**
- Acute oral toxicity: No data available
- Acute inhalation toxicity: No data available
- Acute dermal toxicity: No data available

**Components:**

**3,5-Bis(hydroxymethyl)-p-cresol:**
- Acute oral toxicity: No data available
- Acute inhalation toxicity: No data available
- Acute dermal toxicity: No data available

**2-Methoxypropyl acetate-1:**
- Acute oral toxicity: No data available
- Acute inhalation toxicity: No data available
- Acute dermal toxicity: No data available

**2-methoxy-1-methyl ethyl acetate:**
- Acute oral toxicity: LD50 (Rat, male and female): 6.190 mg/kg
  Method: OECD Test Guideline 401
- Acute inhalation toxicity: No data available
- Acute dermal toxicity: LD50 (Rat, male and female): > 2.000 mg/kg
  Remarks: (ECHA)

**Skin corrosion/irritation**

**Product:**
No data available

**Components:**

**3,5-Bis(hydroxymethyl)-p-cresol:**
Result: Irritating to skin.

**2-methoxy-1-methyl ethyl acetate:**
Species: Rabbit
Exposure time: 24 h
Method: OECD Test Guideline 404
Result: No irritation
Remarks: (ECHA)

**Serious eye damage/eye irritation**

**Product:**
No data available
Components:

3,5-Bis(hydroxymethyl)-p-cresol:
Result: Irritating to eyes.

2-methoxy-1-methylethyl acetate:
Species: Rabbit
Method: OECD Test Guideline 405
Result: No eye irritation

Respiratory or skin sensitisation

Product:
No data available

Components:

2-methoxy-1-methylethyl acetate:
Test Type: Maximisation Test
Exposure routes: dermal
Species: Guinea pig
Method: OECD Test Guideline 406
Result: Does not cause skin sensitisation.

Germ cell mutagenicity

Product:
No data available

Components:

2-methoxy-1-methylethyl acetate:
Genotoxicity in vitro: Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Carcinogenicity

Product:
This information is not available.

Components:
This information is not available.

Reproductive toxicity

Product:
No data available

Components:

2-Methoxypropyl acetate-
Effects on fertility:
Effects on foetal development: No data available
Reproductive toxicity - Assessment: May damage the unborn child.

STOT - single exposure

Product: No data available

Components:

3,5-Bis(hydroxymethyl)-p-cresol:
Assessment: May cause respiratory irritation.

2-Methoxypropyl acetate-1:
Exposure routes: Inhalation
Assessment: May cause respiratory irritation.

2-methoxy-1-methylethyl acetate:
Assessment: May cause drowsiness or dizziness.

STOT - repeated exposure

Product: No data available

Components:

Repeated dose toxicity

Product: No data available

Components:

2-methoxy-1-methylethyl acetate:
Species: Rat, male and female
NOAEL: >= 1.000 mg/kg
Application Route: Oral
Method: OECD Test Guideline 422
Remarks: (ECHA)

Aspiration toxicity

Product: No data available

Components:

11.2 Other information
SECTION 12: Ecological information

12.1 Toxicity

Product: No data available

Other dangerous properties can not be excluded.
Handle in accordance with good industrial hygiene and safety practice.

Headache
narcosis

Components:

3,5-Bis(hydroxymethyl)-p-cresol:
No data available

2-Methoxypropyl acetate-1:
No data available

2-methoxy-1-methylethyl acetate:

Toxicity to fish:
- LC50 (Oncorhynchus mykiss (rainbow trout)): 134 mg/l
  - Exposure time: 96 h
  - Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates:
- EC50 (Daphnia magna (Water flea)): 373 mg/l
  - Exposure time: 48 h
  - Method: OECD Test Guideline 202

Toxicity to algae:
- EC50 (Pseudokirchneriella subcapitata (green algae)): > 1,000 mg/l
  - Exposure time: 96 h
  - Method: OECD Test Guideline 201

Toxicity to microorganisms:
- EC10 (activated sludge): > 1,000 mg/l
  - Exposure time: 30 min
  - Method: OECD Test Guideline 209

Toxicity to fish (Chronic toxicity):
- EC50: 63,5 mg/l
  - Exposure time: 14 d
  - Species: Oryzias latipes (Orange-red killifish)
  - Method: OECD Test Guideline 204
  - Remarks: (ECHA)

  NOEC: 47,5 mg/l
  - Exposure time: 14 d
  - Species: Oryzias latipes (Orange-red killifish)
  - Method: OECD Test Guideline 204
  - Remarks: (ECHA)

Toxicity to daphnia and other aquatic invertebrates:
- NOEC: >= 100 mg/l
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

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aquatic invertebrates (Chronic toxicity)
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Test Type: semi-static test
Method: OECD Test Guideline 211

12.2 Persistence and degradability

Product:
No data available

Components:

3,5-Bis(hydroxymethyl)-p-cresol:
No data available

2-Methoxypropyl acetate-1:
No data available

2-methoxy-1-methylethyl acetate:
Biodegradability: Result: Readily biodegradable.
Exposure time: 28 d
Method: OECD Test Guideline 301F
Remarks: (ECHA)

Biochemical Oxygen Demand (BOD):
330 mg/g
Incubation time: 5 d
Remarks: (IUCLID)

Chemical Oxygen Demand (COD):
1.740 mg/g
Remarks: (IUCLID)

ThOD: 1.820 mg/g
Remarks: (IUCLID)

12.3 Bioaccumulative potential

Product:
No data available

Components:

3,5-Bis(hydroxymethyl)-p-cresol:
No data available

2-Methoxypropyl acetate-1:
Partition coefficient: n-octanol/water: log Pow: 0.5 (25 °C)
Method: EPI Suite™
Remarks: Bioaccumulation is not expected.
(Lit.)

2-methoxy-1-methylethyl acetate:
Partition coefficient: n-octanol/water: log Pow: 1.2 (20 °C)
Method: OECD Test Guideline 117
12.4 Mobility in soil

**Product:**
No data available

**Components:**

3,5-Bis(hydroxymethyl)-p-cresol:
No data available

2-Methoxypropyl acetate-1:
No data available

2-methoxy-1-methylethyl acetate:
No data available

12.5 Results of PBT and vPvB assessment

**Product:**
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.

**Components:**

3,5-Bis(hydroxymethyl)-p-cresol:
No data available

2-Methoxypropyl acetate-1:
No data available

2-methoxy-1-methylethyl acetate:
Assessment: Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

12.6 Other adverse effects

**Product:**
Additional ecological information: No data available

Discharge into the environment must be avoided.

**Components:**

3,5-Bis(hydroxymethyl)-p-cresol:
No data available

2-Methoxypropyl acetate-1:
No data available

Remarks: Bioaccumulation is not expected.
SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product: See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

Air transport (IATA)

14.1. UN/ID No.: UN 1993
14.2. Proper shipping name: Flammable liquid, n.o.s.

(2-Methoxy-1-methylethyl acetate)

14.3. Class: 3
14.4. Packing group: III
14.5 Environmentally hazardous: --
14.6 Special precautions for user: no

Sea transport (IMDG)

14.1. UN number: UN 1993
14.2. Proper shipping name: FLAMMABLE LIQUID, N.O.S.

(2-Methoxy-1-methylethyl acetate)

14.3. Class: 3
14.4. Packing group: III
14.5 Environmentally hazardous: --
14.6 Special precautions for user: yes
EmS Code: F-E, S-E

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

Land transport (ADR/RID)

14.1. UN number: UN 1993
14.2. Proper shipping name: FLAMMABLE LIQUID, N.O.S.

(2-Methoxy-1-methylethyl acetate)

14.3. Class: 3
14.4. Packing group: III
14.5 Environmentally hazardous: --
SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

- Regulation (EC) No 850/2004 on persistent organic pollutants: Not applicable
- REACH - List of substances subject to authorisation (Annex XIV): Not applicable
- Regulation (EC) No 1005/2009 on substances that deplete the ozone layer: Not applicable
- REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59): Not applicable
- Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals: Not applicable
- REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII): 2-Methoxypropyl acetate-1


<table>
<thead>
<tr>
<th>P5c</th>
<th>FLAMMABLE LIQUIDS</th>
<th>Quantity 1</th>
<th>Quantity 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5.000 t</td>
<td>50.000 t</td>
</tr>
</tbody>
</table>

Storage class: 3

Other regulations: Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out.

SECTION 16: Other information

Training advice
Provide adequate information, instruction and training for operators.

Revision Note
Safety datasheet sections which have been updated: SECTION 2 (Classification and labeling)

Full text of H-Statements

- H226: Flammable liquid and vapour.
- H315: Causes skin irritation.
- H319: Causes serious eye irritation.
- H335: May cause respiratory irritation.
- H336: May cause drowsiness or dizziness.
H360D: May damage the unborn child.

Key or legend to abbreviations and acronyms used in the safety data sheet

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50% of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Disclaimer

The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.