MATERIAL SAFETY DATE SHEET

Conductive Aluminum Paste

Safety Data Sheet Preparation Procedures and Statement prepared according No. 29204 dated 13/12/2014 of Hazardous Materials and Mixtures, and is organized according to the regulation.

1. IDENTIFICATION OF MIXTURE AND COMPANY

1.1. Product Identifier
Product Name: Conductive Aluminum Paste

1.2. Product Application: For use only industrial application

1.3 Supplier
Company Name: Arıteks Boyacılık Ticaret ve Sanayi A.Ş
Address: Hekimsuyu Cad. No: 36 Küçükköy Gaziosmanpaşa İstanbul
Phone: +90 282 676 41 90
Fax: +90 282 676 46 13
E-mail: support@ariteksnanotek.com

1.4 Emergency Telephone Number
Company Consultation: +90 282 676 41 90
Fire Station: 110
Emergency First Aid Center: 112
Poison Information Center: 114

2. HAZARDS IDENTIFICATION

2.1 Hazard Classification and Labeling
Flammable Solid - Category 2; H228
Cause skin irritation – Category 2; H315
Cause serious eye irritation – Category 2; H319
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Attention
H228 : Flammable solid.
H315 : Cause skin irritation
H319 : Cause serious eye irritation.
P210 : Keep away from heat/sparks/open flames/hot surface – No smoking.
P264 : Wash thoroughly after handling.
P280 : Wear protective gloves / protective clothing/ eye protection/ face protection.
P281 : Use personal protective equipment as required.
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.
P332 + P313 : If exposed or concerned: Get medical advice/attention.
P337 + P313 : If eye irritation persists: Get medical advice/attention.

2.3 Other Hazards
BT or vPvB Substances : Data not available.
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3. COMPOSITION/INFORMATION on INGREDIENTS

3.1 Hazards Chemicals in the Mixture

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Cas No</th>
<th>%</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>7429-90-5</td>
<td>20-70</td>
<td>Pyropforic solid 1; H250</td>
</tr>
<tr>
<td></td>
<td>231-072-3</td>
<td></td>
<td>Water reaction 2; H261</td>
</tr>
<tr>
<td>p – ment 1-en-8-ol</td>
<td>98-55-5</td>
<td>20-50</td>
<td>Skin Irritation 2; H315</td>
</tr>
<tr>
<td></td>
<td>202-680-6</td>
<td></td>
<td>Eye Irritation 2.; H319</td>
</tr>
<tr>
<td>Frit Powder</td>
<td>65997-18-4</td>
<td>10-30</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>266-047-6</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Cellulose, ethyl ether</td>
<td>90004-57-3</td>
<td>1-10</td>
<td>-</td>
</tr>
</tbody>
</table>

3.2 Other Warning

Risk (R) and Hazards (H) meaning were given at chapter 16.

4. FIRST AID MEASURES

4.1 Description of First Aid Measures

Apply a doctor. Submit this form for doctor's information.

**Eye Contact**

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

**Skin Contact**

Remove affected person from source of contamination. Remove contaminated clothing. Wash the skin immediately with soap and water. Get medical attention if any discomfort continues.
Inhalation
Remove exposed person from exposure to fresh air. If exposed person is not breathing, call emergency first aid center and then give artificial respiration. Get medical attention immediately. Call the poison information center.

Ingestion
Do not induce vomiting the exposed person. If the exposed person's conscious is open, drink one glass of water, if conscious is close, don't give any thing on the oral. Rinse the mouth with water. Seek medical advice.

4.2. Most Important Symptoms and Effects Both Acute and Delayed
Data not available.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed
Data not available.

5. FIREFIGHTING MEASURES
5.1. Extinguishing Media
Appropriate Extinguishing Media; Water spray, foam, dry chemical powder, carbon dioxide.
Inappropriate Extinguishing Media; Water – jet.

5.2. Special Hazards Arising from The Substance or Mixture
Incomplete fire makes carbon monoxide. Toxic and hazardous gases were comprised of during the fire. Any person must discharged under wind direction.

5.3. Advice for Firefighters
Wear self-contained breathing apparatus as combustion may produce hazardous fumes.

5.4. Other Information
Avoid pollute the environment by use excess extinguisher. Dispose the contaminated water according to local and regional authority requirements.
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6. ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures
Use personal protective equipment. Be sure that have a good ventilation. Use breathing apparatus in insufficient ventilation. Steer the personnel to safe area.

6.2. Environmental Precautions
Collect the polluted water which is used for extinction. Do not permit mixing to natural water, earth and sewage, otherwise inform the competent authority.

6.3. Methods and Material for Containment and Cleaning up
Put the deciduous product on convenient container and remove according to waste management regulations. Clean the area plenty of water. Keep away from open flame, spark and lighter.

6.4. Reference to Other Sections
For safe usage, see section 7. For personal protection, see section 8. Collect and dispose of spillage as indicated in section 13.

7. HANDLING AND STORAGE

7.1. Precautions for Safe Handling
Avoid direct contact.
Avoid contact with skin and eyes.
Don't breathe the product. Supply adequate ventilation.
Use personnel protection equipment.
Wash your hand with water and soap after working.
Forbid eat, drink and smoking at the execution area.
Keep away from food, beverage, and animal feed.
Keep eyes and body shower at the working area.
Keep our of open flame, spark and lighter.
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Do not permission mixing to natural water, earth and sewage, otherwise inform the competent authority.

7.2. Storage
Keep material in own container in a dry, cool and well ventilated place and tightly closed. Label the containers. Keep away from the open fire, spark and lighter.

7.3. Specific end use(s)
Data not available.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters
Aluminum; TWA: 10 mg/m3 (total dust) – 4 mg/m3 (respirable dust)

8.2. Exposure Controls
Provide adequate ventilation to avoid exceeding acceptable exposure limits. Keep occupational exposure limits and minimize the risk of inhalation of dust.

General Protection and Hygienic Measures
Wash hand at the end of the each work. Promptly remove any clothing that becomes contaminated. When using do not eat, drink or smoke.

Respiratory Equipment
Don't respire the product. Use ventilation or standard EN 140 respirator mask.

Eye Protection
Use eye protection equipment, tested and approved under appropriate government standard such as EN 166 on high risk of splatter.

Hand Protection
Use appropriate chemically durable glove made of neoprene, PVA, butyl or nitrile according to standard EN 374 if necessary. Check the gloves before using.
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Body Protection

Use overall protective work-wear meet the requirements standard EN340. Use EN 347 standard work shoes. Don't use contaminated clothes before cleaning.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on Basic Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Paste</td>
</tr>
<tr>
<td>Color</td>
<td>Data not available.</td>
</tr>
<tr>
<td>Odor</td>
<td>Data not available</td>
</tr>
<tr>
<td>pH</td>
<td>Data not available</td>
</tr>
<tr>
<td>Melting/Freezing Point</td>
<td>Data not available</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Data not available</td>
</tr>
<tr>
<td>Flash Point</td>
<td>Data not available</td>
</tr>
<tr>
<td>Inflammableness</td>
<td>Data not available</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Data not available</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Data not available</td>
</tr>
<tr>
<td>Density</td>
<td>Data not available</td>
</tr>
<tr>
<td>Autogenous Ignition Temp.</td>
<td>Data not available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Data not available</td>
</tr>
<tr>
<td>Distribution Coefficient</td>
<td>Data not available</td>
</tr>
<tr>
<td>Oxidizing Properties</td>
<td>Data not available</td>
</tr>
</tbody>
</table>

9.2. Other Information

Data not available.

10. STABILITY AND REACTIVITY

10.1. Reactivity

No specific reactivity hazards under envisaged usage and storage conditions.
10.2. Stability
Stable under envisaged usage and storage conditions.

10.3. Possibility of Hazardous Reactions
No hazardous reaction noted at envisaged usage and storage conditions.

10.4. Conditions to Avoid
Keep away from fire, spark and lighter. Avoid exposure to high temperatures or direct sunlight.

10.5. Incompatible Materials
Strong acid and strong oxidizing substance.

10.6. Hazardous Decomposition Products
Incomplete composition is comprise of carbon mono oxide.

11. TOXICOLOGICAL INFORMATION

11.1. Acute Toxicity
Aluminum:
Oral; LD50 > 15900 mg/kg bw (rat, male/female)
Respiration; LC50 > 0,888 mg/l air (rat, male, 4 hours)

p – ment- 1- en -8- ol :
Oral; LD50: 2830 mg/kg bw (rat, male/female)
Respiration; LC50 > 2000 mg/l air (rat, male, 4 hours)

11.2. Skin Corrosion / Irritation
Cause skin irritation.

11.3. Serious Damage to Eyes/Eye Irritation
Cause eye irritation.

11.4. Sensitizer Effect
Not classified as sensitizer.
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11.5. Mutagenity
No mutagenic classified complex in the mixture.

11.6. Carcinogenicity
Not carcinogenic material in the mixture.

11.7. Toxicity for Reproduction System
Not classified as toxic material for reproduction system.

11.8. Specific Target Organ Toxicity – Expose once
No data available.

11.9. Specific Target Organ Toxicity – Expose repetitive
No data available.

11.10. Aspiration Hazard
No data available.

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity

**Aluminum:**
Fish; LC50 > 218,6g/l (Pimephales promelas 96 hours)
Water flea; LC50: 0.071 mg/l (Ceriodaphnia dubia,48 hours)
Alg; EC50: 16.9 µg/L (Pseudokirchnerella subcapitata, 72)

**p-ment-1-en-8-ol:**
Fish; LC50 :70 mg/l (Pimephales promelas 96 hours)
Water flea;EC50:73 mg/l (Ceriodaphnia dubia,48 hours)
Alg; EC50: 68 mg/L (Pseudokirchnerella subcapitata, 72)

12.2. Persistence and Degradability
No data available.

12.3. Bioaccumulative Potential
No data available.
12.4. Mobility
No data available.

12.5. Results of PBT and vPvB assessment
No data available.

12.6. Other Adverse Effects
No data available.

13. DISPOSAL CONSIDERATION
13.1. Waste Treatment Methods
Secure Disposal
It is highly advised dispose according to waste management regulation. Avoid to mix with the underground and overland water, drinking water, standing and flowing water and sewage.

Waste Code
Choose appropriate code according to waste management regulations as listed in appendix-4.

Waste Package
It is highly advised to dispose according to regulation on packaging waste control.

14. TRANSPORT INFORMATION
14.1. General
The product is classified by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID)

14.2. UN Number
UN 3178

14.3. Transport Hazard Class
Flammable solid, inorganic.
14.4. Transport Classification

Class : 4

Danger Label : 4 - Flammable Solid

14.5. Packing Group

III

14.6. Environmental Hazards

Sea Pollutant; No.

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

No date available.

14.8. Other Information

Hazard Identification No : 40
Classification Code : F
Tunnel Code : (E)
EmS : F – A, S – G
15. REGULATORY INFORMATION

15.1. Statutory Information
This document prepared and written by accredited expert personnel within the scope of “The Turkish Ministry of Environment and Urban Planning published its Regulation on Safety Data Sheets for Hazardous Substances and Mixtures, No. 29204, December 13, 2014.”

15.2. Other Regulations
ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road
Packaging Waste Control Regulations – (24 August 2011 and No 28035)
Waste Management Regulations – (2 April 2015 and No 29314)
IMDG Code – International Maritime Dangerous Code
Regulations on Health and Safety in Working with Carcinogenic and Mutagenic Substances-(6 August and No 28730)
Regulations on Health and Safety in Working with Chemicals – (12 August 2013 and No 28733)
Regulation of Personal Protective Equipment Uses (2 July 2013 – 28695)
Regulation on Classification, Packaging and Labeling of substance and mixture – (11 December 2013 and No 28848)

16. Other Information
16.1 Name of SDS Creator, Editor, Publisher

16.2. Revision Information
Revision No : 0
Revision Date : -
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16.3. Abbreviations

ADR : European Agreement Concerning the International Carriage of Dangerous Goods by Road.
CAS No : Chemical Abstract Service Number
EC No : European Inventory Number of Chemical Substances
H250 : Catches fire spontaneously if exposed to air.
H261 : In contact with the water releases flammable gases.
H315 : Cause skin irritation.
H319 : Serious damage to eyes/eye irritation.
IATA : International Air Transport Association.
IC50 : Half Maximal Inhibitory Concentration
ICAO : International Civil Aviation Association.
IMDG : International Maritime Dangerous Goods Code
LC50 : Lethal Concentration, 50%
LD50 : Median Lethal Dose
REACH : Registration, Evaluation, Authorization and Restriction of Chemicals
SEA : Classification, Packaging and Labeling Administration (11 September 2008 and No: 27092)
STEL : Short Time Exposure Limit
TWA : Time weighted Average.

16.4. Other Information

This Material Safety Date Sheet was regulated according to owner information from firm. These information may not valid substance or mixture is mixed to another substances or mixtures or used another process.