Aluminum Arsenide (AlAs) Semiconductors

Topics Covered

Description
Applications
Chemical Properties
Electrical Properties
Thermal, Mechanical and Optical Properties
Safety Information

Description
Aluminum arsenide is a semiconductor material that has almost the same lattice constant as that of gallium arsenide. It can form a superlattice with gallium arsenide which results in its semiconductive properties.

Aluminum arsenide readily reacts with acid, acid fumes and moisture. Decomposition of aluminum arsenide will produce hazardous arsenic gas and arsenic fumes.

Applications
Aluminum arsenide finds applications in the following areas:

- Optoelectronic devices
- Solar cells
- Quantum well devices
- High-electron-mobility transistors.

Chemical Properties
The chemical properties of aluminum arsenide are provided in the table below:

<table>
<thead>
<tr>
<th>Chemical Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Formula</td>
</tr>
<tr>
<td>Molecular Weight</td>
</tr>
<tr>
<td>CAS No.</td>
</tr>
<tr>
<td>Group</td>
</tr>
<tr>
<td>Arsenide - 15</td>
</tr>
<tr>
<td>Crystal Structure</td>
</tr>
<tr>
<td>Lattice Constant</td>
</tr>
</tbody>
</table>

Electrical Properties
The electrical properties of aluminum arsenide are provided in the table below:

<table>
<thead>
<tr>
<th>Electrical Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dielectric Constant</td>
</tr>
<tr>
<td>Band Gap</td>
</tr>
<tr>
<td>Electron Mobility</td>
</tr>
<tr>
<td>Hole Mobility</td>
</tr>
</tbody>
</table>

Thermal, Mechanical and Optical Properties
The thermal, mechanical and optical properties of aluminum arsenide are provided in the tables below:

<table>
<thead>
<tr>
<th>Thermal Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat of Formation</td>
</tr>
<tr>
<td>Thermal Expansion Coefficient</td>
</tr>
</tbody>
</table>
Aluminum Arsenide (AlAs) Semiconductors

Properties:
- Density: 3.81 g/cm³
- Melting Point: 1740°C
- Knoop Microhardness: 5000

Optical Properties:
- Refractive Index: 3.16
- Chromatic Dispersion: -1.277 µm⁻¹

Safety Information:
- GHS Hazard Statements:
  - H301 - Toxic if swallowed
  - H311 - Toxic if inhaled
  - H410 - Very toxic to aquatic life with long lasting effects.
  - H331 - Toxic if inhaled
  - H301 - Toxic if swallowed
- Safety Precautions:
  - P261 - Avoid breathing dust/fume/gas/mist/vapours/spray
  - P301 + P310 - If swallowed, immediately call a poison center or doctor/physician
  - P311 - Call a poison center or doctor/physician
  - P301 - Dispose of contents/container to an approved waste disposal.
  - P501 - Dispose of contents/container to an approved waste disposal.

Date Added: Apr 18, 2013 | Updated: Sep 10, 2013

Tell Us What You Think
Do you have a review, update or anything you would like to add to this article?

Leave your feedback

Submit