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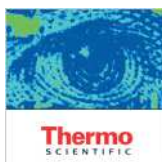
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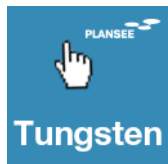
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Aluminum Arsenide (AIAs) Semiconductors

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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:

Chemical Properties	
Chemical Formula	AIAs
Molecular Weight	101.9031
CAS No.	22831-42-1
Group	Aluminum - 13 Arsenide - 15
Crystal Structure	Cubic
Lattice Constant	5.6622 Å

Electrical Properties

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

Electrical Properties	
Dielectric Constant	10.9
Band Gap	2.16 eV
Electron Mobility	1200 cm ² /Vs
Hole Mobility	420 cm ² /Vs

Thermal, Mechanical and Optical Properties

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

Thermal Properties	
Heat of Formation	627 kJ/mol
Thermal Expansion Coefficient	3.50 μm/m°C



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Density	3.81 g/cm ³
Melting Point	1740°C
Knoop Microhardness	5000

Optical Properties

Refractive Index	3.16
Chromatic Dispersion	-1.277 μm ⁻¹

Safety Information

Safety Information

GHS Hazard Statements	H301 - Toxic if swallowed H331 - Toxic if inhaled H410 - Very toxic to aquatic life with long lasting effects.
Safety Precautions	P261 - Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray P273 - Avoid release to the environment P301 + P310 - If swallowed, immediately call a poison center or doctor/physician P311 - Call a poison center or doctor/ physician P501 - Dispose of contents/ container to an approved waste disposal.

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

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