



## Aluminum Nanoparticles PRODUCT DATA SHEET

### Aluminum Nanoparticles

#### Description

Aluminum (Al) nanoparticles have unique optical, physical, and chemical properties that make them candidates for use in a variety of applications, ranging from nanophotonics and catalysis, to the preparation of high energy composites. The large specific surface area and energy density and their associated high reactivity of aluminum nanoparticles have made them unique combustible additives in propellant formulations for significantly higher and faster energy release. Nanoscale aluminum may also offer significant opportunities in the development of high-capacity hydrogen storage materials, either directly or through other reactive compounds such as aluminum hydrides. Through precise control of the synthetic process, Abvigen has the ability to fabricate a variety of shapes and sizes and to optimize properties for your application.

Abvigen can provide a range of high quality Aluminum nanoparticles with different shapes, including concave cubes, cubes, spheres, octahedra, triangular prisms, and wires. The product has high repeatability between batches, which can meet the needs of different personalized materials such as research and development, testing and production of various customers.

For custom sizes, formulations or bulk quantities please contact our customer service department.

**Website:** [www.abvigen.com](http://www.abvigen.com) **Phone:** +1 929-202-3014 **Email:** [info@abvigenus.com](mailto:info@abvigenus.com)

#### Characteristics

Type: Aluminum Nanoparticles

Surface: Modifications ranging from metal oxide shells such as silica to organic ligands including, polystyrene, polydopamine, and small linker molecules.

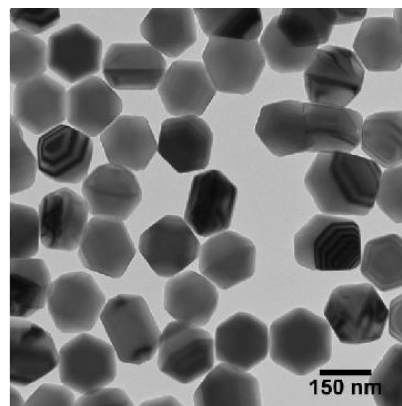
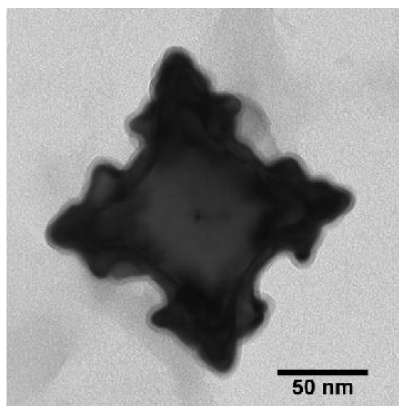
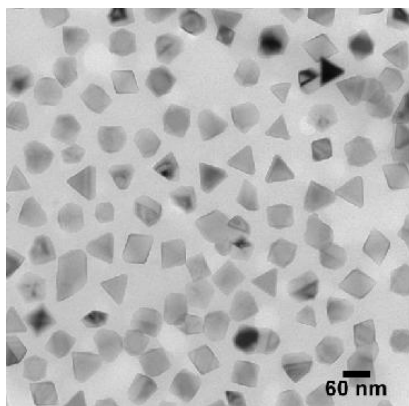
Shape: Concave cubes, cubes, spheres, octahedra, triangular prisms, and wires

Size: From 15 nm to over 500 nm

Concentration: < 10 mg/mL

Matrix: 1-propanol or toluene

## TEM of Aluminum Nanoparticles



## Advantages

- Large specific surface area
- Large energy density
- High reactivity
- Flexible optical properties

## Applications

- Fuel in propellants and pyro techniques
- Hydrogen production
- Light-weight and high-strength materials
- Biomarker
- Drug delivery carrier
- Photothermal therapy agent

## Quality Control

When stored as recommended (2 ~ 8°C), Aluminum nanoparticles are stable for 6 months to > 1 year. Be sure to visually inspect your materials before each use. If there are any visible particulates floating in the solution, if the color of the solution has changed, or if the color intensity has decreased, the nanoparticles may have aggregated. These materials should be analyzed via UV-Visible spectroscopy, DLS, or TEM for quality verification.

**Do not freeze.** If nanomaterials in solution are frozen, the nanoparticles will irreversibly aggregate and the solution color may change.



### Handling

Shake each bottle prior to use. During storage, the nanoparticles may settle to the bottom of the vial (especially nanoparticles > 30 nm in diameter). Prior to aliquoting or use, resuspend the settled nanoparticles by vigorously shaking the bottle until the solution is homogenous. This will typically require ~30 s of mixing. Visually inspect the bottom of the container to ensure that there are no remaining settled particles.

### Ordering Information

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Phone: +1 929-202-3014

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