



## NANOCAT® ALUMINUM POWDER UNCOATED

### PRODUCT IDENTIFICATION

Identification label: **ALUMINUM POWDER UNCOATED, Al(50)**. This powder was prepared by dispersion of a metallic wire in argon, then passivated in slow dry air stream. Chemical name: aluminum powder, chemical formula: Al; GAS registration number: GAS 7429-90-5; DOT definition: Al powder, flammable solids.

### CHEMICAL COMPOSITION

Material: aluminum (90-92%) and aluminum oxide (7-9%). Absorbed gases – up to 1%.

### PHYSICAL AND CHEMICAL PROPERTIES

Appearance and color: gray powder. The bulk density is about 0,07g/cm<sup>3</sup>. BET surface area – 24.5m<sup>2</sup>/g. Melting point is 640°C. SEM and TEM micrographs of powder particles are shown in Fig.1. The particle size distribution bar chart is shown in Fig.2. Probable (mean arithmetic) size  $\tilde{a}_n = 77$  nm; average-surface size  $\tilde{a}_s = 89$  nm; average-mass size  $\tilde{a}_m = 103$  nm. High resolution transmission electron microscopy (HRTEM) shows numerous crystalline defects. The powder reacts with water at 50°C and to release hydrogen. Ignites in air if exposed to open fire. Al(50) exothermically reacts with oxygen-containing liquids, halogen organics and other oxidizers. Al(50) is stable in dry air if heated to 80°C. Ignition point is about 300°C. Al(50) powder can find its application in pyrotechnics and materials sciences.

### DANGER

Al(50) is classified as a flammable powder, which burns with open fire of high intensity, including ignition by static electric charges. Release of hydrogen is possible in reactions. Fire-fighting means: special extinguishers for burning metals. KEEP OFF WATER.

## HEALTH HAZARD

ALUMINUM POWDER UNCOATED is a nuisance dust that may cause necrosis of the eye cornea. According to TWA, dangerous concentration is  $5\text{mg}/\text{m}^3$ . Maximum allowable concentration is  $0.1\text{mg}/\text{m}^3$ .

## SAFE HANDLING

Use health protection measures commonly used in working with readily flammable solids. Wear respirators. Do not heat above  $300^\circ\text{C}$ .

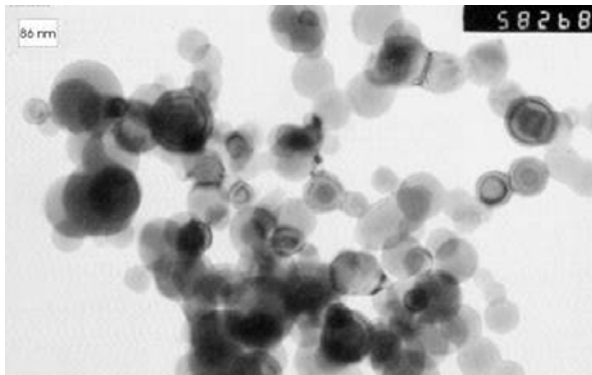


Fig.1 Aluminum powder particles.

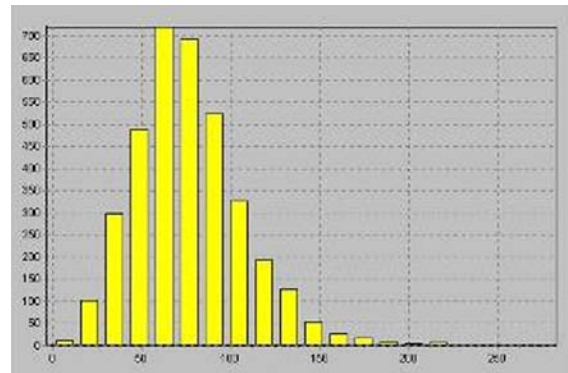


Fig.2 Particle size distribution for Aluminum powder uncoated.  
X- axis: particle size in nm;  
Y-axis: number of particles.

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