



NANOCAT® ALUMINUM POWDER COATED

PRODUCT IDENTIFICATION

Identification label: **ALUMINUM POWDER COATED, P-Al(50)**. This powder was prepared by dispersion of a metallic wire in argon, it was then coated with palmitic acid for the purpose of passivation. Chemical name: aluminum powder, chemical formula: Al; GAS registration number: GAS 7429-90-5; DOT definition: Al powder, flammable solids. Palmitic acid: chemical formula $\text{CH}_3(\text{CH}_2)_{17}\text{CO}_2\text{H}$.

CHEMICAL COMPOSITION

Material: aluminum (90-92%) and palmitic acid (7-9%). Aluminum oxide 1-3 %.

PHYSICAL AND CHEMICAL PROPERTIES

Appearance and color: gray heavily agglomerated powder. The bulk density is 0.32-0.37 g/cm^3 . Melting point is 640°C. SEM and TEM micrographs of powder particles are shown in Fig.1. The particle size distribution bar chart of dry powder is shown in Fig.2. Probabilistic (arithmetic mean) particle size $\tilde{a}_n = 77$ nm; mean size by surface area $\tilde{a}_s = 89$ nm; mean size by mass - $\tilde{a}_m = 103$. High Resolution TEM shows numerous crystalline defects in these particles. The powder does NOT react with water if not heated up to the boiling point. Ignites in air if exposed to open fire. P-Al(50) is stable in dry air if heated to 80°C. Ignition point is about 300°C. P-Al(50) powder can find its application in pyrotechnics and materials sciences.

DANGER

P-Al(50) is classified as a flammable powder, which burns with open fire of high intensity. Fire-fighting means: special extinguishers for burning metals. KEEP OFF OPEN FIRE.

HEALTH HAZARD

P-Al(50) is a nuisance dust that may cause necrosis of the eye cornea. According to TWA, dangerous concentration is 5 mg/m^3 . Maximum allowable concentration is 0.1 mg/m^3 .

SAFE HANDLING

Use health protection measures commonly used in working with readily flammable solids. Wear respirators. Do not heat above 300°C .

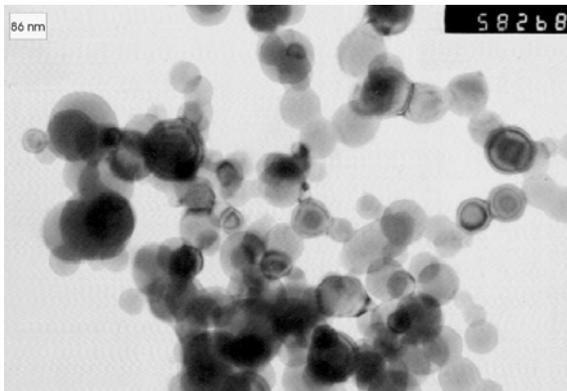


Fig.1 Aluminum powder particles.

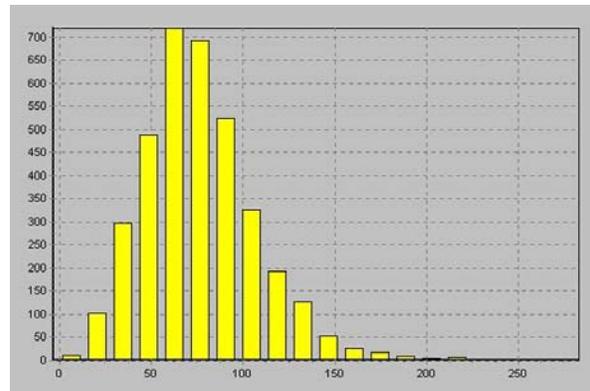


Fig.2 Particle size distribution.
X-axis: particle size in nm; Y-axis:
number of particles.

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