



NANOCAT® INCONEL 625 POWDER

PRODUCT IDENTIFICATION

Identification label: name: **INCONEL 625 POWDER**. Chemical name: alloy NiCr powder, chemical formula: powder – NiCr. This powder was prepared by electric explosion of a metallic wire in argon and packaged in glass ampoules or bottles under inert atmosphere.

CHEMICAL COMPOSITION

Powder consists of 61% of metal nickel and 21,4% chromium. Powder batches contained impurities as follows:

Mo: 9%
Nb+Ta: 3,65%
Si: 0,125%
Al: 0,2%
Ti: 0,2%
Contents of carbon: 5 – 10%.

PHYSICAL AND CHEMICAL PROPERTIES

Appearance and color: dark gray powder. The particles are spherical and form $\leq 10 \mu\text{m}$ agglomerates. TEM micrograph of particles is shown in Fig 1. Bulk density of dry powder is about 0.66 g/cm^3 . Average particle size is 100 nm.. BET surface area – 4.5 to $6.0 \text{ m}^2/\text{g}$. Probabilistic (arithmetic mean) particle size $\tilde{a}_n = 52 \text{ nm}$; surface area mean size $\tilde{a}_s = 63 \text{ nm}$; mass mean size - $\tilde{a}_m = 76$. HRTEM images reveal many crystalline defects. When exposed to low calorie heat source (spirit-lamp) in open air, this powder is ignited for 5 s. Linear burning front propagation rate is 0.70 mm/c with front length 22 to 23 mm. Melting point is 1452°C . This material may be applied in catalysis and materials science.

DANGER

Readily combustible metal powder. This material also has general toxic and irritating effects. Maximum allowable day concentration is 0.001 mg/m³. Explosion-safe.

HEALTH HAZARD

Nuisance dust. If inhaled, may cause headache, elevated body temperature, vertigo and weakness. Irritates eye cornea.

SAFE HANDLING

Use health protection means as those used for handling readily flammable substances. Wear respirators. Do NOT heat above 200°.

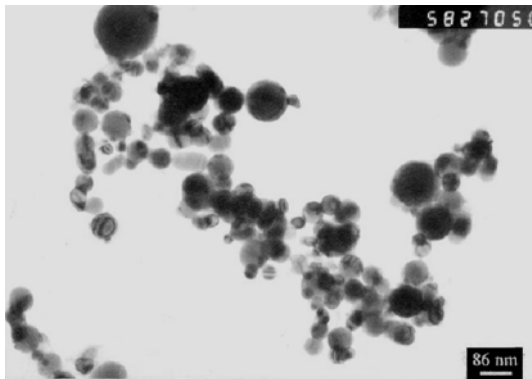


Fig.1 Inconel powder particles.

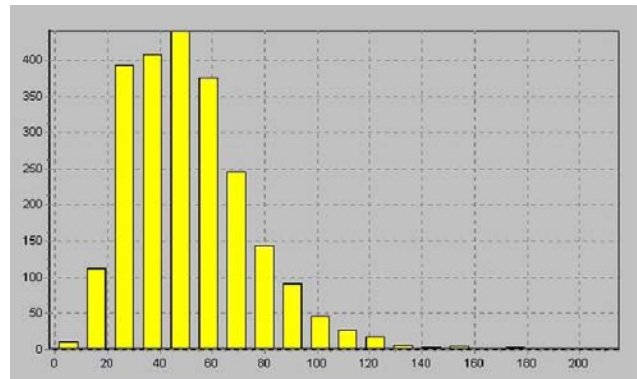


Fig.2 Particle size distribution.
X-axis: particle size intervals in nm;
Y-axis: number of particles.

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