

Air and water oxidation of aluminum flake particles (Article)

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Abstract

The article deals with the oxidation of aluminum flake particles with specific surface area ranged from 0.37 m²/g to 0.73 m²/g. The investigated powders which consisted of the above mentioned flake particles contained metal aluminum in high values (95–98 mass %). The powders possess a high hydrogen release rate (up to 27 cm³/min) by the interaction with calcium hydroxide water solution. The powders under study revealed a high reactivity while oxidized in a non-isothermal mode in air. The reactivity parameter values for aluminum flake particles can be compared to those of aluminum spherical nanoparticles. The application of these aluminum flake particles were possible in two directions due to their high metal content in combination with low specific surface area and high reactivity: pyrotechnics and cellular concrete production. © 2016

Author keywords

Aluminum flake particles; Oxidation; Reactivity; Spherical nanoparticles

Indexed keywords

Engineering controlled terms: Nanoparticles; Oxidation; Powder metals; Powders; Reactivity (nuclear); Specific surface area

Aluminum flakes; Cellular concretes; High reactivity; Hydrogen release; Reactivity parameters; Spherical nanoparticles; Water oxidation; Water solutions

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