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Article 1

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The concept of transition to rationing negative impact on the environment based on the best available techniques

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Key words: environmental protection, best available techniques, complex ecological permissions

Abstract

The principles of creation of Russian reference books on best available techniques are considered. It is shown that application of the principle of rationing of admissible impact on environment based of the best available techniques will allow to increase technological efficiency and environmental safety of the country.

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Article 2

Molchan N. V., Fertikov V. I.

The concentration of electrons as a structural characteristic of oxides

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Key words: concentration of electrons, density, enthalpy, oxides, structure

Abstract

The calculations of the concentration of electrons (C_{elektr}, mol/cm^3) for simple and complex substances on the basis of reference data on the density of matter in the condensed state are presented. Correlation dependences of the concentration of electrons with an enthalpy of formation of a number of oxides and

their coefficients of consolidation are revealed. It is proposed to use the concentration of electrons as the structural characteristic of the materials.

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Article 3

Shakhov S. A., Rogova E. V., Zhapbasbaev U. K.

Influence of parameters of ultrasound treatment on disaggregation of ultrafine powders

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Key words: powder, ultrafine additive, aggregates, disaggregation, ultrasound, cavitation

Abstract

Theoretical and practical results of research of influence duration of ultrasound treatment on the particle size distribution in powder are received. It is established that ultrasound treatment promotes intensive destruction of aggregates only in the initial period of processing. The efficiency of disaggregation of powders at a frequency of 18–44 kHz does not exceed 20%. It is shown that the efficiency of disaggregation of ultradispersed powders can be increased by treatment under reduced hydrostatic pressure.

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Article 4

Samchenko S. V., Zemskova O. V., Kozlova I. V.
Influence of dispersion of the slag component on the properties of slag cement
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Key words: slag cement, ultrafine slag, dry mixing, hydration, cement stone, crystalline hydrates, compressive strength, porosity, degree of hydration, particle size, fine ground slag components

Abstract

Presents the results of researches on introduction of ultrafine slag with a particle size of 1 and 20 μm in the composition of the slag cement by dry mixing. Studied construction and technical properties of cement paste, carried out physical and mechanical tests of cement and determined its structural characteristics. The optimal concentration of ultrafine slag, which allows to increase operational characteristics of cement stone, are established.

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Article 5

Gusev B. V., Galoushkin Y. A., Yen-Liang Yin Samuel, Speransky A. A.
Laws of volume periodicity in structure of physical-chemical elements and adaptive materials science

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Key words: substance, energy, information, matrix of the laws of structure of physical-chemical elements, homeostasis, construction materials and bio-tissues

Abstract

The paper covers fundamental triunity of knowledge within the system «substance – energy – information» as a basis for development of ideas about matrix of the laws of structure of physical-chemical elements, perspectives of creating instruments for observation of homeostatic states of new materials technosphere and biosphere of VI wave of innovation.

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