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ABSTRACT

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IOZSEF JUHASZ

EXPERIMENTAL RESEARCHES ON THE COPPER ELECTROLYTE PURIFICATION

Keywords: *electrolyte, copper recovery, refinement, thermodynamic.*

ABSTRACT:

In this paper there are presented the experimental results obtained in the electrolyte purification process from the copper electrolytic refinement. This work was proved theory with the thermodynamic analysis in this system, as well as experimentally under various conditions.

REZUMAT:

În lucrarea de faţă sunt prezentate unele rezultate experimentale obţinute în procesul de purificare a electrolitului de la rafinarea electrolitică a cuprului. Aceasta lucrare a demonstrat teoria cu ajutorul analizei termodinamice a sistemului, atat experimental cat si pentru diferite conditii date.

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VALER MICLE , LILIANA FODOR, TIBERIU LEHENE, IOAN VIDA-SIMITI , NICOLAIE JUMATE

THE PRELIMINARY STUDIES TO ELABORATE A METALLIC COMPOSITE ALUMINUM MATRIX WITH CARBON NANOTUBES

Keywords:*aluminium matrix composite, powder metallurgy, casting, carbon nanotubes*

ABSTRACT

This paper presents the view upon the recent studies concerning the methods of obtaining aluminum matrix composite reinforced with carbon nanotubes. It is remarked the fact that the majority of the researchers approached the methodology of obtaining metal matrix composite with carbon nanotubes through the utilization of the powder metallurgy and through the infiltration of molten metal. It was experimented the realization of a composite material with matrix of aluminum and carbon nanotubes by casting. The analyses of the composite material elaborated through casting at the scanning electron microscope (SEM) showed us the fact that the uniform dispersion of carbon nanotubes in the aluminum matrix wasn't achieved, the individual presence of carbon nanotubes in the analyzed structure wasn't evidenced. The difficulties related by obtaining the metal composite with aluminum matrix and carbon nanotubes trough casting lead to the necessity of identification of other solutions, among these would be the powder metallurgy.

REZUMAT

În cadrul lucrării se face o privire asupra experimentărilor de data recenta privind metodele de obţinere a materialelor compozite metalice cu matrice de aluminiu armate cu nanotuburi de carbon. Se remarca faptul ca majoritatea cercetătorilor au abordat metodologia de obţinere a materialelor compozite metalice cu nanotuburi de carbon prin utilizarea metalurgiei pulberilor si prin infiltrarea metalului topit. S-a încercat prin experimentări obţinerea unor materiale compozite cu matrice de aluminiu şi nanotuburi de carbon prin turnare. Analiza materialelor compozite elaborate prin turnare cu microscopul electronic cu baleiaj (SEM) ne-a arătat faptul că nu s-a realizat o dispersie uniformă a nanotuburilor de carbon în matricea de aluminiu, nefiind evidenţiată prezenţa individuală a nanotuburilor în structura analizată. Dificultăţile legate de obţinerea materialelor compozite metalice cu matrice de aluminiu si nanotuburi de carbon prin turnare conduc la necesitatea identificării altor soluţii iar dintre acestea cea mai potrivită este prin metalurgia pulberilor.

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VALENTIN ZICHIL , MIRELA PANAINTE, VALENTINE NEDEFF, EMILIAN MOSNEGUTU , CARMEN SAVIN , BOGDAN MĂCĂRESCU , CIPRIAN OLARU

CONSIDERATIONS ABOUT A NEW METHOD ABLE TO DETERMINE THE BREAKING UP ENERGY AT MATERIALS WITH VARIABLE TEXTURE

Keywords: *variable texture, breaking, textural property, energy consumption, rheology.*

ABSTRACT:

The paper present a new method able to determine the breaking up energy at materials with variable texture as well as the factors which influence the breaking process in case of products with variable texture, stress and strain state into the cutting tool, during the breaking up process.

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EFFECT OF ZrO_2 PARTICLES UPON Cu-ZrO_2 MATERIAL USED FOR THE SPOT WELDING ELECTRODES

Keywords: *spot welding, composites, powder metallurgy*

ABSTRACT

The paper presents the results of research on the obtaining of the Cu-ZrO_2 composite through procedures specific to powder metallurgy, destined for the resistance welding electrodes. The best results were obtained for the samples that contained 1% zirconium oxide. The electrical conductivity of the obtained Cu+1% ZrO_2 material ranges around the value of 50% IACS. The structure was analyzed by electron microscopy (SEM) and local chemical analysis (EDS). The designed electrodes were subjected to endurance tests on an automatic spot welding machine according to standards ISO 14270 The performed studies show that the size of the ZrO_2 particles should be less than 5 micrometers, since the large ZrO_2 particles break due to deformation during welding.

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CLAUDIA TĂNASE, ADRIAN DIMA, VALENTIN STRECHE

THE 3D-OPERATED, CURVED TRAJECTORY UNDERGROUND PNEUMATIC ROCKET USED FOR DITCHLESS UNDERGROUND PIPE LAYING

Keywords: *pneumatic rocket, self-guided, introducing pipes, ditchless*

ABSTRACT:

A high-technology challenge: direct, ditchless, 3D varied trajectory, underground pipe laying in various public fields – water supplying, sewer, gas supplying, electric cables, telecommunications, TV broadcast, the Internet or agriculture – irrigation and / or drainage. Classical, open-ditch underground networking has been severely restricted due to economic, social and environmental factors. In the developed countries only high-standard, highly productive ditchless technology is applied. After building and testing the pneumatic rocket FORI 80, operated in straight line, we want to present the self-guided, curved trajectory, pneumatic rocket for ditchless underground pipe laying.

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IOAN GHIMBĂŞEANU

INTERACTIVE SOFT FOR DETERMINING THE MAXIMUM VALUES OF STRESS FIELDS IN THE SUPPORT-TYPED STRUCTURES

Keywords : *interactive software , mechanical testing, finite element method, mechanical tension*

ABSTRACT

The aim of the paper is to develop interactive software for monitoring the mechanical testing of the multifunctional materials. Thus, the conceptual, theoretical and methodological framework in IT for generating new instruments, technologies for specific applications in the area of mechanical testing. Taking into account the state of the art of knowledge in this area, the following specific objectives are proposed in the paper: developing techniques and methods for mechanical testings for advanced multifunctional materials; modelling the state of tension in tubes subjected to mechanical testings by using the method with finite element; designing programmes for a database containing the results obtained during the theoretical and experimental research; developing interactive programmes for monitoring the results obtained by simulating the state of mechanical tension in the studied materials.

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ION MELINTE, MIHAELA BALANESCU, MIRCEA HRITAC, ADRIAN DUMITRU TANTAU , IRENE SAMOILA, ADRIAN NECSULESCU

THE SUBSTANTIATION OF THE METHODS FOR REDUCING THE CO_2 EMISSIONS IN IRON AND STEEL PROCESSES, BASED ON INTEGRATED APPROACH, BOTH TECHNOLOGICAL AND ENERGETIC

***Keywords*:** CO_2 emissions, primary methods, emissions reduction, mathematical model, integrated system

ABSTRACT

This paper presents the way of the substantiation of the methods for reducing the CO_2 emissions in iron and steel processes, both technological, as well as combustion processes, in case of integrated, technological and energetic approach, using the calculus programs and patterns and simulations of the process input parameters (quantities of raw and basic materials, fuel feeds, carbon content in the basic materials and in the fuels).

There are approached primary methods for reducing the CO_2 emissions from the iron and steel processes, namely the modification of the process input parameters, or the modification of the actual process (technological or combustion), for improving its technologic or energetic efficiency.

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