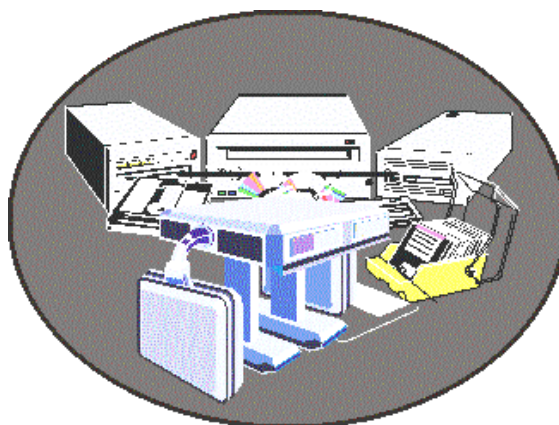




**AL V-LEA SIMPOZION CU PARTICIPARE INTERNAȚIONALĂ
„MECATRONICĂ, MICROTEHNOLOGII ȘI MATERIALE NOI”
TÂRGOVIȘTE
16 Noiembrie 2007**



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ORGANIZATOR

FACULTATEA INGINERIA MATERIALELOR, MECATRONICĂ ȘI ROBOTICĂ
DEPARTAMENTUL DE MATERIALE, ECHIPAMENTE, INSTALAȚII ȘI ROBOȚI

PROGRAMUL DE DESFĂȘURARE A LUCRĂRILOR

- ❖ Primirea participanților: 9⁰⁰-10⁰⁰ -
- ❖ Deschiderea SIMPOZIONULUI: 10⁰⁰-12⁰⁰
- ❖ Pauză : 12⁰⁰-12³⁰
- ❖ Prezentare recenzii lucrări : 12³⁰- 14³⁰
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- ❖ Prezentare recenzii lucrări : 15³⁰- 17³⁰
- ❖ Masă festivă : ora 18⁰⁰ - 20⁰⁰

**SIMPOZIONUL A FOST REALIZAT SUB PATRONAJUL
MINISTERULUI EDUCAȚIEI CERCETĂRII ȘI TINERETULUI
ACADEMIEI DE ȘTIINTE TEHNICE DIN ROMANIA – ASTR**

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23. CONSIDERAȚII TEORETICE PRIVIND NATURA PERIOADEI DE INCUBAȚIE A TRANSFORMĂRII PERLITICE– pp. 433-439

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26. ALTERNATIVE IRON MAKING TECHNOLOGIES– pp. 471-476

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28. MODALITĂȚI CONCRETE DE ALIERE A OȚELURILOR RAPIDE pp. 481-485

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29. HEAVY METAL FUMES THREATEN HEALTH OF WELDERS– pp. 486-491

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30. METODĂ NECONVENȚIONALĂ DE SINTEZĂ A NANOPRECURSORILOR FERITICI ȘI FERITEI PE BAZĂ DE COBALT– pp. 492-497

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REZUMATELE LUCRARILOR

I. SECȚIUNEA PRODUSE MECATRONICE ECHIPĂMENTE INTELIGENTE ȘI ROBOTICĂ

**REFERENT: Conf. univ. dr. ing. GHEORGHE GHEORGHE
INCDMF Bucuresti, Universitatea VALAHIA din TÂRGOVIȘTE**

1. MONITORIZAREA EMISIILOR ACUSTICE GENERATE IN PROCESUL DE RECTIFICARE PENTRU EVALUAREA STARII DE UZURA A DISCULUI ABRAZIV

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Rezumat: Lucrarea prezinta cercetarile efectuate pentru stabilirea corelatiilor dintre nivelul emisiilor acustice generate in timpul procesului de rectificare si gradul de uzura al pietrei abrazive. Cunoasterea acestei corelatii permite atat monitorizarea procesului de prelucrare pentru mentinerea prelucrarii in limitele stabile (abateri dimensionale, de forma, rugozitate) cat si optimizarea lui prin reducerea timpilor auxiliari de lucru si mentinerea parametrilor de aschiere ai sculei abrazive.

2. MECHATRONIC MANIPULATION TECHNIQUES ON TRANSFER TECHNOLOGICAL LINES

Authors: Paul BECA, Marian VOCUREK, Cristiana MARINESCU - National Institute for Research and Development for fine Mechanic , Bucharest, Email: paulbeca@yahoo.com, m_cris90@yahoo.com,

Abstract: The attainment of the objectives regarding the increase in competitiveness of the products in the European economic space becomes a reality by means of the use of the transfer technology lines designed within a modular, flexible system. Comprising innovative concepts, this mechatronic equipment is mainly based on the utilisation of materials with highly used features. This paper presents the structure and main features of the Mechatronic Equipment with Cartesian Robot – EMRC Type which is included in the area of the research for improving product quality by the utilisation of the state-of-art technologies. The paper develops new intelligent processing and transfer techniques for products like carcasses.

3. MONITORIZAREA GRADULUI DE UZURA AL ELEMENTELOR DE RULARE A MIJLOACELOR DE TRANSPORT FERVIAR IN VEDEREA CRESTERII SIGURANTEI CIRCULATIEI SI REDUCERII POLUARII SONORE

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Gabriel BALANOIU, Bogdan IONITA – SC AEROFINA SA Bucuresti

Rezumat: Lucrarea prezinta un sistem de monitorizare si control a elementelor de rulare pentru imbunatatirea mentenantei si sigurantei transportului feroviar si reducerea poluarii sonore. Sistemul de control dinamic noncontact se monteaza in depouri, de o parte si de alta a cailor de rulare. Sistemul permite masurarea tuturor parametrilor importanti care determina profilul rotii intr-o sectiune: inaltimea buzei profilului (S_r); grosimea buzei profilului (S_d); gradientul buzei profilului (q_r); latimea totala a profilului (L_r); diametrul cercului de rulare al rotii (D_r); uzura pe cercul de rulare al rotii (A). Acest sistem opereaza la viteze relativ reduse, sistemul fiind utilizat in depouri. Sistemul se poate instala in aproape orice pozitie a sinei cu modificari nesemnificative ale acesteia. Sistemul permite identificarea fiecărei roti si stocarea rezultatelor intr-o baza de date.

4. IMPLANT INSTRUMENTS, APPARATUS AND ELEMENTS

Authors:

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Abstract: The work has for goal presentation of the realizations of the National Institute for Research and Development in the dental medicine domain. Presentation of a modular system for implantation and prosthetics for cranial face and jaw surgery, dental implants and associated instrumentary, and also the preoccupations regarding composite materials for dental medicine.

5. ABOUT MEDICAL ROBOTICS

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Abstract: This paper's aim is to study the new type of medical robots, as well as to design, make and implement an original model of intelligent orthosis mean for neuromotor rehabilitation. By the reason of complexity theme approached, we consider that the research activities are very varied and they involve knowledge about biomechanics, mechatronics and robotics, analyses, numerical shaping and simulation, assisted design and many also, therefore this paper may be considered a pluridisciplinary work.

6. ABOUT HUMAN ORTHOSES

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Abstract: This paper's aim is to study the new type of orthoses, as well as to design, make and implement an original model of intelligent orthosis mean for neuromotor rehabilitation. By the reason of complexity theme approached, we consider that the research activities are very varied and they involve knowledge about biomechanics, mechatronics and robotics, analyses, numerical shaping and simulation, assisted design and many also, therefore this paper may be considered a pluridisciplinary work.

7. DESIGN OF A COLUMN INDUSTRIAL ROBOT TYPE USED IN AUTOMATIC MOUNTING

Author: Paul Ciprian PATIC - University VALAHIA Targoviste Email: patic@yahoo.com.

Abstract: The column Industrial Robots type represents a large used category, starting with the period of the beginning of automatic flexible manufacture. Preponderantly, these column industrial robots are used largely in manipulation operations of a different spares with small and medium dimensions, in general, with regulate forms, which is processed by splinting methods in flexible cells ready in star or circular way of the components.

8. AN INTEGRATED RELIABILITY TYPE OF ANALYSIS AND DIAGNOSTICS FOR SOME INDUSTRIAL SYSTEMS

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Abstract: Critical power systems, such as data centers and communication switching facilities, have very high availability requirements. Even a momentary interruption of two seconds may cause a loss of two hours of data processing. Consequently, power quality has emerged as an issue of significant importance in the operation of these systems. In this paper, we address some issues of power quality like: real-time detection and diagnosis of power quality problems, reliability and availability evaluation, and capacity margin analysis. The objective of real-time detection and diagnosis is to provide a seamless on-line monitoring and off-line maintenance process. Capacity margin analysis helps operators to plan for additional loads and to schedule repair/replacement activities.

9. CONCEPTUL CIM (COMPUTER INTEGRATED MANUFACTURING) DEFINIT DE IBM

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Rezumat: Sistemele de fabricație ale ultimei decade ale acestui secol și primele decade ale secolului următor vor reprezenta bancuri de încercare ale conceptelor de fabricație integrat cu calculator (CIM – Computer-Integrated Manufacturing) ale viitorului. Ar fi marele avantaj al proiectantului și inginerilor de fabricație dacă ar avea disponibilitatea unui model relativ CIM, având astfel o gamă diversă de componente de sistem de fabricație de bază și unelte de configurație pentru a putea concepe, la un moment dat, un sistem particular de fabricație pentru orice produs pe care ei doresc să-l construiască. În cele ce urmează sunt prezentate cateva modele construite de diverse corporații pentru a servi scopului prezentat mai sus.

10. STRUCTURI DE CONTROL PENTRU SISTEMELE DE FABRICARE ÎN DOMENIUL CAM

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Rezumat: Lucrarea își propune prezentarea principalelor structuri de control utilizate în componența sistemelor de fabricație din domeniul CAM. Domeniul CAM implică în mod predominant executarea de sarcini de control; totuși, monitorizarea de date, intrarea de date și evaluarea împreună cu controlul pot fi de asemenea funcții în această arie. Sistemele de control corespunzătoare pot fi structurate din perspectiva mai multor puncte de vedere. Se face o distincție între structurile de control funcționale, hardware și software.

Adesea aceste trei structuri nu sunt singurele criterii care determină arhitectura de control. Reprezentarea controalelor și a sistemelor de control în termeni de structuri ajută la proiectarea lor și favorizează înțelegerea acestor resurse. În cele ce urmează, aceste structuri vor fi prezentate pe baza a trei criterii.

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11. DYNAMIC STRESSES OCCURRING AT RECTANGULAR AND SEMI SINUSOIDAL IMPULSE SHOCK LOADING OF AN ELASTIC SYSTEM

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Abstract: The dynamical stresses occur in case of shock loading and they are very important for the manufacturers due to the fact that they can reach significant values which can be higher than the allowable stresses of the material. These stresses depend on the shock's intensity (the maximum or the average value of the dynamic force), impulse duration and last but not least, on the dynamic rigidity and mass characteristics of the mechanical system. This article presents the dynamic coefficient variation with the relative impulse variation t_1/T , under the conditions of a rectangular impulse shock loading (T is the eigenperiod of vibrations of the elastic system)

12. DETERMINATION OF AXIAL FORCE INFLUENCE ON THE DISPLACEMENTS OF A COMPRESSED AND BENT BEAM

Authors:

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Abstract: At the elastic stable equilibrium of compressed beams, if the axial compressive force increases the total potential energy increases $\Delta\Pi > 0$, in other words the variation of elastic deformation potential energy is larger than the work done by exterior forces. In the case of unstable equilibrium, the total potential energy decreases $\Delta\Pi < 0$, so the variation of elastic deformation potential energy is smaller than the work done by exterior forces. This article conducts the computations of displacements for a beam subjected to compression and bending. The displacements are determined as function of axial force of compression and the results are obtained by two different methods.

13. STUDII PRIVIND STABILITATEA PROCESULUI DE REGLARE LA APARATE PNEUMO – HIDRAULICE AUTOMATE

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Rezumat: Instabilitatea este o problemă actuală, autooscilțiile sistemelor ce conțin aparate automate de reglare fiind un fenomen des întâlnit. Lucrarea urmărește stabilirea prin experiment, a principalilor factori care facilitează apariția fenomenului și propune măsuri practice de diminuare a instabilității proceselor de reglare.

14. A METHOD OF DEDUCTION OF THE CALCULUS FORMULA OF THE ABSOLUTE VELOCITY AND ABSOLUTE ACCELERATION IN CASE OF THE COMPOUND MOTION OF A PARTICLE

Author: Vladimir Dragos TATARU - University "Valahia" of Targoviste - Mechanical Department

Abstract: In the paper is presented in a very detailed manner the proof of the calculus formula of the absolute velocity and absolute acceleration in case of the relative motion of a particle. The method is based on matrix calculus. First one will express the particle coordinates relatively to the fixed reference frame using a matrix relation. Then this relation will be derived with respect to time and in this way we will obtain successively the formulas with the aid of which we may compute the absolute velocity and the absolute acceleration respectively.

15. DYNAMICS SURVEY OF PHYSICAL PENDULUM WITH TWO DEGREES OF FREEDOM

Author: Vladimir Dragos TATARU - University "Valahia" of Targoviste - Mechanical Department

Abstract: The paper presents a method of dynamics survey of the physical pendulum which from mechanical point of view is a system with two degrees of freedom. This method is based on matrix computation and it consists in writing the equations of motion for each solid rigid body which compound the system as if it were free. Then these equations of motion will be assembled taking into account the constraint forces. The method may be extended to any systems with three or more degrees of freedom as well. The physical pendulum with two degrees of freedom whose dynamics survey is shown in the paper serves only as a model of the application of the method.

16. EULER'S EQUATIONS FOR SOLID RIGID BODY WITH GENERAL MOTION DEDUCED BY D'ALEMBERT PRINCIPLE

Author:

Vladimir Dragos TATARU - University "Valahia" of Targoviste - Mechanical Department

Abstract: The paper gives a detailed account of Euler's motion equations deduction starting from d'Alembert principle. Euler's equations are used for the dynamics survey both of the free and subjected to constraints solid rigid body. The method is based on the matrix calculus. With that end in view the elements of the inertia forces torque will be calculated relatively to the origin of the movable frame. Then will be calculated the elements of the applied forces torque and finally d'Alembert principle will be applied.

17. METHOD OF COMPUTATION OF THE ABSOLUTE ANGULAR VELOCITY AND ABSOLUTE ANGULAR ACCELERATION IN CASE OF COMPOUND MOTION OF THE SOLID RIGID BODY

Author: Vladimir Dragos TATARU - University "Valahia" of Targoviste - Mechanical Department

Abstract: This paper presents in a very detailed manner the proof of the calculus formula which is used for the computation of the absolute angular velocity and the absolute angular acceleration in the case of the compound motion of the solid rigid body. The relative angular velocity relatively to the movable reference frame and the movement of the mobile frame relatively to the fixed reference frame are considered to be known. Further on the absolute angular velocity and the absolute angular acceleration are to be calculated. The method which is presented is based on matrix calculus.

18. THE STRESS FIELD ON THE CRACK TOP FOR THE 213K TEMPERATURE, INTO STAINLESS STEEL

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Abstract. In order to achieve the work we have processed flat samples, CT model, with side cut, made of stainless steel mark 10TiNiCr175. They have been challenged at fatigue through eccentric traction, with the asymmetry coefficients $R=0.1$, $R=0.3$ and $R=0.5$. The test temperature was $T=213K$ ($-60^{\circ}C$). During the experimentations we noted the a_i crack's length variation and the numbers of corresponding cycles N_i . According to the studies made in the field, through numerical calculus we have determined the stress intensity factor ΔK on top of the crack, the stresses on the front of the crack σ_x and σ_y and the σ_c stress, considering the phenomenon as a challenge composed by the traction with bending. For the three asymmetry coefficients we have drawn curbs of the shape $\sigma(a)$, $\sigma(N)$, $\sigma(\Delta K)$.

19. THE INFLUENCE OF THE TEMPERATURE TO CRACKING RATE AND THE STRESS BY 10TiNiCr175 STEEL

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Abstract. The paper proposes a study for the propagation rate of the crack through the standard polynomial method and through the secant method, respectively for the σ stress on top of the crack in a material challenged during fatigue through eccentric traction. The analyzed material was a stainless steel of the V2A class, mark 10TiNiCr175, and the challenge was performed with the asymmetry coefficient $R=0.5$. The CT type samples were tested at three temperatures: $T=293K$, $T=253K$ and $T=213K$. We noted the variation of the a_i crack's length and the numbers of cycles N_i . With these primary parameters we have calculated the cracking rate da/dN , the stress intensity factor ΔK and the stress σ . We made the graphical representations of the rate da/dN and the

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20. ANALIZA INFLUENȚEI REGIMULUI DE AȘCHIERE ASUPRA TEMPERATURII TĂIȘULUI SCULEI

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Rezumat: Căldura degajată în procesul de așchiere contribuie la schimbarea condițiilor de lucru. Factorii care influențează temperatura medie a tăișului așchietor sunt: regimul de așchiere, geometria sculei așchietoare, materialul piesei, materialul sculei așchietoare, lichidele de răcire. Dintre parametrii regimului de așchiere, viteza de așchiere are o influență preponderentă asupra temperaturii tăișului sculei așchietoare.

21. ANALIZA DE REGRESIE PENTRU “TEMPERATURA DE AȘCHIERE” ȘI A INFLUENȚEI TEMPERATURII ASUPRA RUGOZITĂȚII SUPRAFEȚELOR STRUNJITE

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Rezumat: Analizând dependența globală a temperaturii T de parametrii regimului de așchiere, se observă o creștere mai accentuată a temperaturii în zona de contact “sculă-piesă” cu viteza de așchiere decât cu avansul de așchiere sau cu adâncimea de așchiere. Se observă totodată o creștere a parametrului de rugozitate R_a odată cu temperatura din zona de contact “sculă-piesă”, indicând deteriorarea calității suprafeței la creșterea temperaturii din zona de așchiere.

22. MĂRIMI CARACTERISTICE FUNCȚIONĂRII MORILOR TUBULARE CU BILE (I)

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Rezumat: În lucrare se prezintă modalitatea de determinare a gradului de umplere al tamburului morii cu corpuri de măcinare și, în funcție de această mărime, o serie de alte mărimi specifice funcționării morilor tubulare cu bile: masa încărcăturii, încărcătura de completare (care compensează uzura corpurilor de măcinare), momentul static al încărcăturii. În realizarea scopului lucrării se utilizează expresii matematice și reprezentări grafice adecvate.

23. MĂRIMI CARACTERISTICE FUNCȚIONĂRII MORILOR TUBULARE CU BILE (II)

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Rezumat: În continuarea studiului asupra unor mărimi caracteristice funcționării morilor tubulare cu bile, în această parte se iau în discuție puterea necesară acționării tamburului morii, momentul de inerție al încărcăturii de măcinare și se fac referiri asupra pornirii unor atare utilaje. Lucrarea se încheie cu un exemplu de calcul ilustrativ.

24. UNELE ASPECTE PRIVIND CALCULUL MORILOR PLANETARE

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Rezumat: În lucrare sunt prezentate morile planetare (numite și mori cu sateliți), principiul lor de funcționare (bazat pe câmpul centrifugal de forțe) și elemente privind bazele teoretice ale acestor tipuri de mori. Sunt prezentate, de asemenea, corelațiile dintre parametrii constructivi și funcționali ai acestor mori, necesare pentru adoptarea corectă a acestora. În final, comparația, bazată pe calcule numerice, între aceste mori și cele tubulare clasice, pune în evidență performanțele lor și orientează asupra modalității de realizare a calculelor.

25. CARACTERISTICI REOLOGICE ALE MATERIALELOR PULVERULENTE ȘI GRANULARE

Autor: Prof. Dr. Ing. Gheorghe ENE, Universitatea POLITEHNICA Bucuresti, Email: ghene01@yahoo.com

Rezumat Materialele pulverulente și granulare au o comportare specifică diferită atât de cea lichidelor, cât și de cea a solidelor. Comportarea lor în diferite situații (instalării de depozitare, transportare, procesare etc.) este definită de o serie de caracteristici reologice specifice, prezentate în această lucrare: rezistența inițială la

forfecare,coeficientul (unghiul) freării interne,coeficientul (unghiul) forfecării interne,coeficientul transmiterii presiunii,inălțimea taluzului vertical liber,unghiul taluzului natural.

26. APLICAȚIE TEHNICĂ REZOLVATĂ PRIN METODELE GEOMETRIEI DESCRIPTIVE

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Rezumat: Cerințele economiei de piața sunt variate și apar situații când soluțiile clasice nu sunt suficiente pentru realizarea diverselor obiective, produse,etc. Apare astfel necesitatea confecționării unor accesorii speciale, așa cum ar fi diverse racorduri la conducte magistrale sau la recipiente cu sau fără presiune;aceste accesorii au configurații geometrice diferite așa cum ar fi și cele cu suprafețe cilindro-conice și de rotație. Astfel, lucrarea constă în rezolvare grafică a intersecției dintre con și cilindru cu bazele situate în același plan.

27. SOME AUTOMATICAL GENERATION OF THE REGRESION FUNCTION OF CUTTING FORCES AND MOMENTS, IN THE CASE OF DRILLING OF SOME HEAT RESISTANCE STEELS

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Abstract: Starting with cutting function and moments expression, which is applied very often in most of the specialty books and having in view a lot of mathematical procedures we established the forces and the moments - F_x , F_y , F_z , M_x , M_y și M_z -using cutting regime parameters of 4 types of heat resistance steels. On the base of mathematical relations established above and using MathCad application, we have generated cutting forces and moments expressions curves, varying cutting regime parameters during drilling processing. The results of our theme are the presentation, of some diagrams useful in cutting process optimization.

28. DISPLACEMENTS STATES FOR A PLANE PLATE AND A RIBBED RADIAL PLATE

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Abstract: In this paper is presented the analyze of the displacements states for a plane plate and a ribbed radial plate, for observing the advantage of the rigidify. The plates, of the same dimensions, are solicited at 0, 3 MPa pressure. For comparison, we used the analytical, finite elements and experimental methods for the plane plate and for the ribbed plate, we used the finite elements and experimental methods.

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29. ANALYSIS AND DESIGN OF THE ORIENTATION MECHANISMS (WRIST)

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Abstract: It is presents a method of kinematic analysis and synthesis of orientation mechanisms (wrist) with two and three output rotations. A classifying criterion is introduced and a unitary kinematic synthesis is used for the main mechanical schemes of orientation mechanisms with two and three independent motions (d.o.f.). For the sake of a unitary kinematic method 3 criteria are considered, which correspond to the orientation mechanism with bevel gearings. In the case of direct kinematics, the movement is computed in two or three sequences and the kinematic chains, specific for each mobility degree, are identified. The reverse kinematics is associated with the kinematic synthesis of the orientation mechanisms. This implies the calculus of the input parameters when the two or three angular output displacements are imposed. A new kinematic schema together with design schema of orientation mechanisms with decoupled movement is presented.

30. ELECTRIC FIELD MODELLING OF THE SF₆ GAS INSULATED SUBSTATIONS

Authors:

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Abstract: Gas Insulated Substations (GIS) have found a broad range of applications in power systems over the last three decades because of their high reliability, easy maintenance, small ground space requirements. For instance, the space requirement can be less than 10% of the space taken up by an equivalent conventional installation. SF₆ is the main insulating medium in almost all gas insulated high voltage equipment, because is having all the desirable properties of a good insulating and arc-quenching medium [8]. This paper applies a two-dimensional (2D) electric field analysis program to calculate the electric field distribution in Gas Insulated Substations. Distribution electric field and electric field strength values is principal criterions concerning insulation size reduction.

31. ASPECTE PRIVIND TEORIA MARUNTIRII MATERIALELOR

Autor: **GHEORGHE ENE** Universiatea "POLITEHNICA" Bucuresti, Splaiul Independentei 313 , 77206 Bucuresti, Sector 6, E-mail: ghene01@yahoo.com

Rezumat: In lucrare este prezentata o noua abordare a teoriilor de maruntire clasice Rittinger, Kick-Kirpicev, Bond care le face mai usor de aplicat practic si randamentul operatiei de maruntire. Exemplul de calcul realizat pentru cazul concret al operatiei, foarte raspandite, de macinare arata ca maruntirea se desfasoara cu un randament foarte scazut, sub 1%.

32. SIMULAREA REZISTENȚEI LA TRACȚIUNE, COMPRESIUNE A UNUI COMPOZIT MACROMOLECULAR

Autori: Maria Cristiana ENESCU, Dan UNGUREANU, Elena STOIAN - Universitatea Valahia din Tîrgoviște, Facultatea de Ingineria Materialelor, Mecatronica și Robotica, Email: cristiana_enescu@yahoo.com, danunguranu2002@yahoo.com

Rezumat. Studiul prezintă simularea analizei rezistenței la tracțiune, respectiv compresiune a unui compozit macromolecular ranforsat cu particule anorganice de silice. Simularea se realizează utilizând programul Soldworks.

33. CONTRIBUTION TO THE DIRECT AND INVERSE GEOMETRICAL MODELING OF A MODULAR SERIAL ROBOT WITH SIX DEGREES OF FREEDOM TYPE RTRTTR

Authors:

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Abstract: The authors of this paper are propounding to distinguish the facility of matrix calculus concerning the direct and inverse geometrical modeling for a structure of serial modular robot with six degrees of freedom type RTRTTR. According to the kinematics scheme of the robot, this is composed by: module 1 of rotation around the vertical axis attached to the base of the robot, module 2 of vertically translation, module 3 of horizontally rotation around the axis O_3x_3 of the arm of the robot, module 4 of translation along the axis O_4x_4 , module 5 of translation along the horizontal axis which is composing the arm of the robot and module 6 of rotation assembled with the clamping device. The direct geometrical modeling will be realized by using the method of rotation matrix 3X3, and the inverse geometrical modeling will be realized by using the algebraic method.

34. RECUNOAȘTEREA AMPRENTEI VOCALE UTILIZÂND MEDODA CUANTIZĂRI VECTORIALE

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Rezumat: Termenul de recunoaștere a vorbitorului desemnează orice aplicație de discriminare a persoanelor pe baza vocii acestora. Tehnologia presupune un proces inițial de antrenare, constând în colectarea de material vocal de la persoana care se dorește a fi recunoscută, și unul de testare, constând în compararea unui fragment de vorbire neidentificat cu datele provenite din antrenare și luarea deciziei de recunoaștere. Există două subclase de aplicații: verificarea vorbitorului și identificarea vorbitorului. Verificarea vorbitorului își propune să determine dacă un fragment de semnal vocal aparține sau nu unui anumit vorbitor, în timp ce identificarea are ca scop punerea în corespondență a unei voci necunoscute cu un vorbitor dintr-un set dat. În această lucrare va fi prezentată metoda cuantizării vectoriale precum și implementarea acesteia în cadrul unei aplicații dezvoltate la Universitatea din Pitești.

35. SUBSTITUTION CRYPTOGRAPHIC SYSTEM – SAFETY COMMUNICATION SYSTEM BETWEEN TWO PERSONAL COMPUTERS

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Abstract: In a modern and democratic society, social development generally, and decisional activity particularly, to the macro and micro level, imposes a bigger consistence to the informational base, because not the decision only, but also daily life request information, information and also information [1]. This paper proposes a cryptographic system, witch, starting to the classical cryptographic systems principles, become a substitution cryptographic system adapted to our days, a complete electronic and information system [2]. It is also realized a concrete model who mark out very good the desired phenomena (the security of data transmission between 2 PC) [3].

365. SISTEME ȘI METODE DE ANALIZĂ ȘI EVALUARE A MICRO ȘI NANOSTRUCTURII SUPRAFEȚELOR PRIN METODE OPTO-ELECTRONICE

Autori: Florin TRĂISTARU, Lucian SAVU, Aurel ABĂLARU, Daniela CIOBOATĂ, Dănuț STANCIU, Ștefan VASILE, Cristian LOGOFĂTU - INCDMF Bucuresti Email : laborator_tm1@yahoo.co, aurel.abalaru@gmail.com, geocefin@yahoo.com.

Rezumat: Lucrarea prezinta metode opto-electronice moderne si echipamente utilizate pentru măsurarea rugozității: Microscopul optice sunt excelente pentru vizualizarea texturii suprafețelor dar ele nu permit măsurări ale parametrilor de rugozitate ai suprafeței, Profilometrele optice sunt ideale pentru măsurarea rapidă a rugozității suprafețelor cu o rezoluție ceva mai mare de 0,5μm. Suprafețe mari pot fi analizate cu astfel de aparate, Scaterometre (de la scatter, împrăștiere, difuzie) ce asigură informații rapide referitoare la rugozitatea suprafeței dar numai dacă aceasta este mai mare de 1μm.

37. IMAGE SCALING FROM SDTV IN HDTV

Autori: Iulian Nicolae UDROIU - University VALAHIA Targoviste E-mail: iudriu@valahia.ro

Ioan Corneliu SĂLIȘTEANU E-mail: cornel_0200@yahoo.com, Ion VASILE, Ion CĂCIULA - University VALAHIA Targoviste

Abstract: This paper presents the images scaling from SDTV in HDTV using a new algorithm of bi-dimensional image scaling named: Content Dependent Scaling .It try to create an image with a greater resolution and with the best quality possible of image.

38. INTEGRATING MICROENGINEERING - AGEING AND DEVELOPMENT CONCEPT OF MECATRONICS AND ROBOTICS IN ROMANIA

Author: Gheorghe GHEORGHE – National Institute for Research and Development for fine Mechanic Bucharest, I.N.C.D.M.F, Email: geocefin@yahoo.com.

Abstract: The paper treats in synthesis the new ageing and development concept of mecatronics and robotics, through integrating engineering expressed by synergetic systems, technical and scientific solutions, engineering Microsystems, diagnosis, analysis, evaluation and decision.

II. SECȚIUNEA MICROTEHNOLOGII NANOTEHNOLOGII ȘI MATERIALE NOI

**REFERENT: prof. univ. dr. ing. RODICA ION
ICECHIM București, Universitatea VALAHIA din TÂRGOVIȘTE**

1. CONSIDERATII PRIVIND COMPORTAREA MECANICA A COMPOZITELOR DIN SISTEMUL CUPRU – GRAFIT

Autori: Florea OPREA, Zorica BACINSCHI, Aurora POINESCU, Dan UNGUREANU, Clara CONSTANTINESCU – Universitatea Valahia Targoviste, Email: bacinschizorica@yahoo.com, poinescua@yahoo.com, danungureanu2002@yahoo.com, claraconst@yahoo.com

Rezumat: Cercetarile intreprinse pe piesele din pulberi de cupru si aliajele pentru diferite raporturi de comprimare arata imbunatatirea caracteristicilor prin utilizarea atmosferei reductoare la sinterizare : cresterea densitati, rezistentei mecanice si a conductivitatii electrice a comprimatelor. Prezenta lucrare arata modul de variatie a acestor proprietati pentru compozite Cu-Gr cu adaosuri de Zn, de grafit si de Pb.

2. STUDIU PRIVIND EFECTELE AGITĂRII ELECTROMAGNETICE LA TURNAREA CONTINUĂ A SEMIFABRICATELOR

Autori:

Vasile BRATU, Marian IONESCU, Dan UNGUREANU , Adrian CATANGIU - Universitatea VALAHIA din Târgoviște Email: vbratur@yahoo.co.uk, ionescu_c_marian@yahoo.com, acatangiu@yahoo.co.uk, danungureanu2002@yahoo.com,

Rezumat: Agitarea electromagnetică constituie o metodă de îmbunătățire a calității semifabricatelor turnate continuu. Scopul lucrării de față îl constituie prezentarea implicațiilor aplicării agitării electromagnetice asupra calității semifabricatelor turnate continuu și asupra parametrilor tehnologici.

3. ANALIZĂ COMPARATIVĂ A SISTEMELOR DE RĂCIRE SECUNDARĂ LA TURNAREA CONTINUĂ A SEMIFABRICATELOR

Autori: Vasile BRATU, Marian IONESCU, Dan UNGUREANU , Adrian CATANGIU - Universitatea VALAHIA din Târgoviște Email: vbratur@yahoo.co.uk, ionescu_c_marian@yahoo.com, acatangiu@yahoo.co.uk, danungureanu2002@yahoo.com,

Rezumat: Creșterea vitezei de răcire a metalului este una dintre metodele de creștere a calității semifabricatelor turnate continuu. Pentru aceasta se folosesc diferite procedee de intensificare și optimizare a răcirii în cristalizor, sub cristalizor și în zona răcirii secundare. În lucrare sunt analizate comparativ metodele mai importante de optimizare a răcirii semifabricatelor turnate continuu, cu avantajele și dezavantajele fiecăreia în parte, precum și influențele acestora asupra parametrilor turnării continue și implicit, asupra calității.

4. MECANISMUL ȘI CINETICA PROCESELOR CARE CONTRIBUIE LA ADERENȚA ȘI COEZIUNEA STRATURILOR COMPOZITE FORMATE PRIN PULVERIZARE TERMICĂ (METALIZARE CU ARC ELECTRIC)

Autori: Ilie BUTNARIU – Universitatea POLITEHNICA București, Email: robertomardar@yahoo.com

Nicolae CONSTANTIN – Universitatea POLITEHNICA București, Email: nctin2005@yahoo.com

Marian IONESCU – Universitatea VALAHIA din Târgoviște, Email: ionescu_c_marian@yahoo.com

Rezumat: În lucrare se prezintă aspecte teoretice și practice privind mecanismul și cinetica proceselor care contribuie la obținerea unei aderențe și coeziuni foarte bune a straturilor compozite metalizate aplicate pe lagărele de alunecare, fusurile de osie și pe diferite repere care lucrează în condiții speciale

5. ASPECTE PRIVIND INTERACȚIUNILE CARE APAR LA INTERFAȚA DINTRE MATRICEA METALICĂ ȘI MATERIALUL COMPOZIT COMPLEMENTAR ÎN PROCESUL DE METALIZARE

Autor: Ilie BUTNARIU – Universitatea POLITEHNICA București, Email: robertomardar@yahoo.com

Rezumat: În lucrare se prezintă aspecte teoretice și practice privind tipurile de interacțiuni care apar la interfața dintre matricea metalică de bază și materialul compozit complementar în timpul procesului de metalizare a reperelor care lucrează în condiții speciale .

6. DETERMINAREA CARACTERISTICILOR TERMICE ALE MATERIALELOR COMPOZITE CU MATRICE ORGANICĂ

Autori: Adrian CATANGIU, A.T.Dumitrescu - Universitatea VALAHIA din Târgoviște Email: acatangiu@yahoo.co.uk , atdumitrescu@gmail.com

Rezumat: Lucrarea prezintă măsurarea caracteristicilor termice ale materialelor compozite cu matrice din rășină epoxidică. Materialele testate provin din preimpregnat utilizat la fabricarea materialelor compozite stratificate prin tehnologia de termoformare cu sac de vid sau în autoclavă, respectiv din roving preimpregnat cu rășină utilizat ca materie primă la construcția corpurilor de revoluție prin tehnologia de înfășurare a filamentului. Au fost efectuate teste de calorimetrie diferențială scanning asupra materialelor polimerizate, în vederea determinării temperaturii limită în exploatare a acestora (temperatura de tranziție vitroasă) și s-au determinat ecuațiile de variație a căldurii specifice cu temperatura. Difuzivitatea termică s-a măsurat printr-o metodă care se bazează pe aplicarea asupra epruvetelor a unui regim termic tranzitoriu generat de un puls laser. Variația în timp a temperaturii epruvetei după furnizarea impulsului termic este dependentă de difuzivitatea termică a materialului și analiza termogramei permite determinarea acesteia.

7. MODELAREA SI VIZUALIZAREA DINAMICII MOLECULARE A FIBREI ARAMIDICE

Autor:

Daniel Sorin CHIRTES - Universitatea Valahia Targoviste, Facultatea de Ingineria Materialelor, Mecatronica si Robotica; Email: chirdanson@gmail.com

Rezumat: Explorarea naturii tridimensionale a moleculelor fibrei aramidice pentru a obtine informatii asupra comportarii acestora precum si observarea dinamicii moleculare printr-o configuratie cu energie minima.

8. INSTALAȚIE PENTRU USCAREA SI INCALZIREA DISTRIBUITOARELOR CIRCULARE

Autor:

Aurel GABA - Universitatea VALAHIA din Targoviste, Email: aurel_gaba@yahoo.com

Rezumat: Lucrarea prezinta un nou tip de instalatie automatizata pentru uscarea și încălzirea distribuitorilor circulare, caracterizata prin utilizarea a doua arzatoare cu impuls, a unui recuperator de radiatie, a unei instalatii de conducere automata a procesului si a unei instalatii de ridicat, care asigura un consum specific minim de gaze naturale, atingerea temperaturii de incalzire de 1500 grd.C, uniformitatea incalzirii si emisii reduse de poluanti , in conditii de operare avantajoase.

9. TECHNOLOGICAL EXPERIMENTS REGARDING THE IMPROVEMENT OF THE TOOL STEELS CLEANLINESS USING THE SLAG PROPERTIES AND THE CHEMICAL HEATING

Autori: **Marian IONESCU**, **Aurora Anca POINESCU** - Universitatea Valahia din Târgoviște, Email: ionescu_c_marian@yahoo.com, poinescua@yahoo.com

Abstract: This paper presents technological solution to improve the cleanliness indicators of some tool alloyed steels. Using the existent equipment (a classic electric furnace and a VOD installation) we intended to obtain a particular slag composition (in the system $\text{CaO-Al}_2\text{O}_3\text{-SiO}_2$) and to use it in an efficient manner (for desulphurization and inclusion control), having in mind the simultaneity with the processes like aluminothermy or vacuum heating.

10. PRODUCTION AND PERFORMANCE OF FOAMED CONCRETE

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Abstract: Foamed concrete can be considered relatively homogeneous when compared to conventional concrete, as it does not contain coarse aggregate phase. However, the properties of foamed concrete depends on the microstructure, composition which are influenced by the type of binder used, methods of pre-foamation and curing. Though it has been widely recognised as an insulation material, a renewed interest is shown by researchers in its structural character exhibits. As the production involves the materials of low density: a few fillers viz fly ash, quarry dust, GGBS and sludge from paper mills. An attempt has been made in the present study to produce foamed concrete of desired density 1600 kg/m^3 to 1800 kg/m^3 . Then their strength properties viz compressive strength, flexural strength and the resistance against sulphate attack were investigated and the results are reported.

REFERENT: prof. univ. dr. ing. ALEXANDRU DUMITRESCU
Universitatea VALAHIA din TÂRGOVIȘTE

11. CERCETĂRI MORFOLOGICE ALE UNOR NANOCOMPOZITE ORGANIC-ANORGANICE PE BAZĂ DE OXIZI METALICI

Autori:

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Abstract: The particle size and the morphology were investigated with a NanoR-Atomic Force Microscope by Pacific Nanotechnology (with X'Pert Software) operating at atmospheric pressure at vibrating mode. The samples analyzed were prepared by depositing a powder on a glass. It was shown that images of the surface morphology are closely connected with the relation between the magnitude of the metallic oxides (TiO_2 or $\alpha\text{-Fe}_2\text{O}_3$) nanoparticles grains and the geometrical size of the polymer molecules. The images of TSPP-Sil-TiO₂ nanoparticles in acrylate matrix have been compared with TiO_2 nanoparticles alone. The images of $\alpha\text{-Fe}_2\text{O}_3$ nanoparticles in polypyrrole matrix have been compared with $\alpha\text{-Fe}_2\text{O}_3$ nanoparticles alone.

12. A MICROPHYSICAL THEORY FOR UNITARY EXPLANATION OF TRANSFORMATIONS MECHANISM IN METALS

Author:

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Abstract: Starting from the Zener relation of variation with the temperature of the pearlitic steel lamellas' thickness, applied to the formation hypothesis of virtual or real pearlitic and bainitic pre-lamellas of α austenite in the period of incubation and considering a mechanism of transformation with continuous diffusion it is deduced an theoretically exponential relation for the thickness of the cementitic and pearlitic lamellas and is argued the validity of Zener relation, also for the thickness of the fragmentation of the bainitic lamellas sub-sub-subunits.

13. COMPORTAREA BORULUI LA ELABORAREA OȚELULUI

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Rezumat. În lucrare se prezintă aspecte teoretice și practice legate de prezența borului în oțel și de efectul deosebit de favorabil pe care acesta îl are asupra proprietăților mecanice și de prelucrabilitate ale oțelurilor, și anume: călibilitate, tenacitate, rezistență la oboseală, uzinabilitate, prelucrare la rece, forjabilitate și prelucrare la cald.

14. OPTICAL PROPERTIES OF SINGLE-WALL CARBON NANOTUBES EMBEDDED IN POLY(VINYL) ALCOHOL FILM

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Abstract : A free-standing film made of a single-wall carbon nanotube (SWCNT)–polyvinylalcohol (PVA) composite material was fabricated by pretreatment of SWCNTs in water that promotes unbundling of aggregated SWCNTs. Characterizations using optical absorption spectroscopy, optical microscopy, and thermal analysis revealed that the film has an optical absorption at approximately 1.5 μm , suitable for the occurrence of saturable absorption (a promising nonlinear optical effect) in optical telecommunication wavelengths, and that SWCNTs in the film are dispersed uniformly with a low scattering loss. The experimental results suggest that the nanotubes bundles are well dispersed in the polymer matrix.

15. MESOMORPHIC MOLECULAR PHTHALOCYANINE MATERIALS FOR ELECTRONICS, OPTO-ELECTRONICS, IONO-ELECTRONICS

Authors: Rodica-Mariana ION - University VALAHIA Targoviste, ICECHIM Bucharest - Romania

Makbule COCAK, Ismail YILMAZ, Zehra ALTUNTAS BAYIR, Esin HAMURYUDAN, Ozer BEKAROGLU- Technical University of Istanbul, Faculty of Science and Letters, Inorganic Chemistry Dept., Istanbul, Turkey

Abstract: Molecular materials are made from molecular units, separately synthesized and subsequently organized into some condensed phases. Because of their very nature, the electrical properties (ferro- and antiferromagnetism, semiconductivity) and the optical properties (polarizability and hyperpolarizability) of the molecular materials may be deduced from the physicochemical characteristics of the isolated molecular units (symmetry, polarity, redox potentials, absorption spectrum). Octaalkyl-phthalocyanine derivatives lead to columnar and nematic lenticular mesophases. These liquid crystalline phases are shown to be usable in the domains of electronics, opto-electronics and iono-electronics. The phthalocyanines have found interest in many fields: as photoconducting agents, electrochromic display device or other information storage systems, as catalysts for different chemical reactions or photocatalysts in ecological systems.

16. MULTI-PURPOSE NANOMATERIALS SUITABLE FOR PRACTICAL APPLICATION

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Abstract: The definition of materials as "substances having properties which make them useful in machinery, structures, devices and products" clearly connects materials with function [1]. In general, solid materials are classified in five categories, based on both their chemical composition and their physical properties: metals, ceramics, polymers, semiconductors, and composites [2]. Composites consist of a combination of metals, ceramics, or polymers. They are designed to display new, unusual properties that are not found in any single material. Nanomaterials are single-phase or multiphase polycrystals with a typical crystal size of 1 to 100 nm in at least one dimension. In this review, some new aspects about the nanomaterial dimensions are discussed as follows (a) nanoparticles, (b) layered or lamellar structures, (c) filamentary structures, magnetic nanoparticles and (d) bulk nanostructured materials.

17. INVESTIGATION OF MECHANICAL CHARACTERISTICS OF DEPOSITED NANOSTRUCTURAL LAYERS

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Abstract : One of most intensive developed research areas in last 10 years is the so-called "surface engineering", which carry out research on properties of thin films and surfaces. The films with thickness from 1 to several scores of the micron have exceptionally large application for protection of materials from corrosion, wearing out, thermal influences, light influences, electromagnetic influences, radiation influences and etc. Deposition of thin films affords an opportunity for achievement of materials with unique combination of physical and mechanical properties that have better properties and economical effectiveness. In this connection investigation of nature, functions and properties of new thin films can be used for development of new technologies for future applications. In order to predict the behaviour of thin films it is important to know their material characteristics. Special investigation is necessary, because material characteristics of the deposited thin films are often quite different from those of the bulk material.

18. HETEROGENEOUS ORGANIC SEMICONDUCTORS FOR PHOTOCATALYTIC OXIDATION OF WATER POLLUTANTS

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Abstract: The photochemical degradation processes is generally based on oxidative reactions initiated by very reactive radicals, such as OH radicals. However, there are a number of refractory substances (nitrophenols being one of them) that degrades very slowly under these conditions. The heterogeneous photocatalysts seems to be one of the most efficient way to destroy aquatic phenolic pollutants. In this paper was developed a new type of heterogeneous photocatalysts that destroy and detoxifies waste water streams containing up to 300 ppm of o-nitro-phenol pollutants. The photochemical degradation of o-nitro-phenol aqueous solution was studied in this paper using as photocatalysts : zinc (II) 2,9,16,23-tetrasulphophthalocyanine (ZnTSPc) supported on SiO₂ and zinc (II) 2,9,16,23-tetracarboxyphthalocyanine (ZnTCPc) supported on hydrotalcite (HT) . Was analysed the influence of hydrogen peroxide and light on the kinetic and reaction mechanism of ONF photodegradation. Reactions are 4-10 times faster than those obtained using the same photocatalysts but in water solution.

19. ENERGY DISPERSIVE X-RAY FLUORESCENCE (EDXRF) ANALYSIS OF STEELS WITH IMPLICATIONS IN ARCHAEO-METALLURGY

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Abstract: Archaeo-metallurgy is, to some extent, applied engineering in a discipline of anthropology. It describes the properties and production of metal objects from archaeological or at least historical contexts. The goal is to learn how ancient metalworkers may have treated their material for the production of weapons and tools as well as jewellery and coins. Energy dispersive X-ray fluorescence (EDXRF) technique has become a powerful technique for non-destructive multielement analysis of materials. A simple method for the analysis of different stainless steel samples is presented in this paper, which is based on radioisotope excited energy dispersive X-ray fluorescence (EDXRF) spectrometry and does not require any type-standards. Generally in stainless steel (SS) samples Ti(0.03–0.08), Si(0.03–1.1), C(0.03–0.06), P(0.005–0.035), S(0.005–0.012), W(0.02–0.3%) etc are present as minor components while Cr(32–2.44), Ni(3.7–2.15), Fe(50.0–70.0), Cu(0.6–2.2) and Mo(1.5–4.0%) are present as major components. In the present paper, we present the results obtained with this method for stainless steel analysis which is simple, fast, non-destructive and does not require any type-standards. We have determined elements Cr, Mn, Fe, Co, Ni, Cu, Nb, Mo etc in the stainless steel samples.

20. MACROCYCLIC COMPOUNDS ENTRAPPED INTO INORGANIC CAVITANDS STRUCTURES

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Abstract: Two-dimensional inorganic networks can show intracrystalline reactivity, i.e., simple ions, large species as Keggin ions, organic species, coordination compounds or organometallics can be incorporated in the interlayer region. The host-guest interaction usually causes changes in their chemical, catalytic, electronic and optical properties. The isolation of materials with interesting properties and making use of soft chemistry routes have given rise to the possibility of industrial and technological applications of these compounds. In this paper, it has been using several synthetic approaches to intercalate porphyrins and phthalocyanines into inorganic materials as layered double hydroxides. Hydrotalcite (layered double hydroxide (HDL)) has been studied in this paper for intercalation of two cationic porphyrins: tetramethylpyridylporphyrins (free base, TMPyP, and the cobalt complex, CoTMPyP) and four anionic phthalocyanines: zinc (II) 2,9,16,23-tetrakisulphophthalocyanine (ZnTSPc) and zinc (II) 2,9,16,23-tetracarboxyphthalocyanine (ZnTCPc), cobalt(II) tetra(4-sulfonatophenyl)porphyrin (CoTSPP) and cobalt(II) tetrasulphophthalocyanine (CoTSPc). These macrocycles have been supported on the external surface of the

LDH (CO_3^{2-} occupies the interlayer region). For porphyrins, out-of-plane twisting by the 5,10,15,20-substituted phenyl rings, provides a route to construct structures extending beyond the macrocycle plane. The new systems were prepared by anion-exchange. The isolated materials have been characterized by IR and UV-Vis diffuse reflectance absorption spectra, X-ray diffraction, surface area measurements. Powder X-ray diffraction data, of the intercalated LDH show complete intercalation. Interlayer d-spacing increased from 18.5 Å and 22.7 Å. Could be suggested that the interlayer arrangement is determined by both the layer charge density of the host materials and the position of the anionic groups substituted on the guest molecules.

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21. SPECIAL MONOLITHIC MATERIALS

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Abstract: The paper shows the constituents and technical properties of low calcium aluminate cement concretes with ultradispersed mineral powders and different admixtures. In the heat treatment conditions the refractory low cement concretes easily develop the high mechanical strengths. This process is a result of the new mineralogical phases apparitions (i. e. mullite, anorthite), due to the reactions between concrete constituents, which have the role of stronger matrix – aggregate ceramic bond and a dense and hardened matrix genesis. But in case of the same type of concretes it is imperatively necessary the development of good strengths in the normal conditions hardening process, too. The advantages of using a judicious ratio of chemical bond, micronized powders as well as particular additive (like polymer) are underlined in order to emphasize their significance in the achievement of concretes having good mechanical properties in normal and heat hardening conditions.

22. DEDUCEREA EXPRESIEI FORȚEI MOTRICE A TRANSFORMĂRII MARTENSITICE DIN POTENȚIALUL BARDEEN

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Abstract: By the Bardeen's expression of the interatomic potential in metals and of the linear expansion, is obtained an expression for the temperature gradient driving force of the martensitic transformation, with generalisation also for the case of the association with a carbon concentration gradient driving force. Was indicated also two explicative implications for the case of the „marmem” transformation driving force and of the Seebeck effect.

23. CONSIDERAȚII TEORETICE PRIVIND NATURA PERIOADEI DE INCUBAȚIE A TRANSFORMĂRII PERLITICE

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Abstract: By an original theoretic model of gradual allotropic Bain transformation of the austenite and the Zener relation of the temperature depending pearlitic lamellas thickness variation, is causatively interpreted the existence of the pearlitic transformation incubation period by the time necessary for the formation of a quasisquared Bain region of supersaturated ferrite without complementary shearing, dimensioned according to the correlation between Zener relation and the internal Bain strain variation. It deduces, by the theoretical model, the P_S curve of TTT diagram and a possible role of the inhomogenous shearing mechanism in the pearlitic transformation mechanism and morphology, analogous to those specific for the bainitic transformation, also evidenced by the model .

24. PRELIMINARIILE PRIVIND UTILIZAREA CALCULATORULUI IN TURNATORII

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Rezumat: In societatea informatizata, globalizarea circulatiei informatiilor realizeaza un sistem multinodal care cuprinde intreaga activitate industriala, inclusiv agentii economici de tipul turnatoriilor. Calculatorul este componenta de baza a unui sistem de gestionare a informatiei; inginerii metalurgi trebuie sa devina utilizatori eficienti ai sistemului informatic computerizat si sa reinvețe proiectarea si conducerea proceselor tehnologice cu aceste aplicatii dedicate. Lucrarea prezinta notiunile elementare care trebuie avute in vedere la implementarea tehnicii computerizate in domeniul metalurgic si in special la agentii economici de tipul turnatoriilor

25. SOFTURI DEDICATE TEHNOLOGIILOR DE TURNARE

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Rezumat: Lucrarea se dorește a fi o sumara sinteza a realizarii ultimilor zece ani in domeniul softurilor dedicate tehnologiilor de turnare. Aceasta trecere in revista a aplicatiilor care s-au impus in practica tehnologica din strainatate si partial de la noi din tara, ar trebui sa contureze tendintele viitoare de informatizare computerizata, proiectrea tehnologica in sistemele CAD/CAE-CAM/CIM, nivelele si standardele generale spre care trebuie sa se fixeze structurarea departamentului national metalurgic, organizarea turnatoriilor si manageriatul acestora, spre o eficienta maxima si interconectarea optima la circuitul european.

26. ALTERNATIVE IRON MAKING TECHNOLOGIES

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Rezumat: In această lucrare se prezinta cateva aspecte referitoare la to noua tehnologie alternativa de producere a pulberii de fier in Romania. Sunt analizate cauzele aparitiei si dezvoltarii unor asemenea tehnologii in competitia de pe piata internationala a otelului. Prezenta tehnologiilor alternative ale producerii fontei si otelului vor produce efecte benefice din punct de vedere metalurgic, economic, social si de mediu. Cercetarile preliminare realizate pornind de la deseuri din industria chimica si metalurgica sunt incurajatoare pentru implementarea procedeeleor alternative de obtinere a fontei si otelului.

27. MICROMECHANICAL MODEL FOR ELASTO-PLASTIC FRACTURE OF METALLIC MATERIALS

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Abstract: Metallic materials ductile fracture is a complex process which suppose the evolution description of cavities formed in different phases of fracture process, as well the elastic stresses contribution for the brittle fracture of the same material, but for different stressing conditions. For description of these phenomena has been proposed a micro-mechanical model for ductile fracture at which has been added a hypo-elastic constitutive equation. Has been used an eulerian approach and macroscopic fields which intervene in the fracture process being obtained by applying the homogenization method.

28. MODALITĂȚI CONCRETE DE ALIERE A OȚELURILOR RAPIDE

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Rezumat: Necesitatea obținerii unor oțeluri rapide cu prețuri de fabricație cât mai mici, prin înlocuirea unor elemente de aliere de bază scumpe cu altele mai ieftine, constituie argumentul principal al cercetărilor prezentate în această lucrare. Alieră economică a condus la obținerea unor oțeluri cu baza de aliere W-Mo sau Mo, care pot fi aliate și cu Si, aspect ce a pus în evidență obținerea unor scule așchietoare cu proprietăți în exploatare apropiate de cele ale oțelurilor rapide cunoscute.

29. HEAVY METAL FUMES THREATEN HEALTH OF WELDERS

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Abstract: Technological process of welding is significant source of pollution of working environment with heavy metals. From all heavy metals being the most significant particulates of air pollutants at working of high-alloy steels from the toxicological viewpoint, chromium is paid main attention at present in many laboratories. It is well established that welding fumes contain toxic substances, and that its composition is dependent on multiple factors, such as nature of the welding process and chemical compositions of the welding consumables and base materials. In order to prevent accidents and, thus to contribute to the safety of protection of welders, the establishment of a database on welding fume components is considered as essential. Stainless steels because of their high chromium content, tend to behave differently with respect to weldability than other steels. At present, it is estimated that more than one million workers are employed as welders worldwide (Sundin, 1998), with more than three million performing welding intermittently as part of their work duties (Sferlazza and Beckett, 1991). Manual metal arc welding (MMAW) and flux core arc welding (FCAW) are two commonly used procedures in the construction industry and in numerous other industrial processes. Welding involves the fusion of metals by high temperature generated via an electrical arc resulting in the formation of metal-enriched fumes. Welding fumes are a complex mixture of gases and small particulates of metal oxides formed by the vaporization and oxidation of metal during the welding process (Lockey et al., 1988; Yu et al., 2000).

30. METODĂ NECONVENȚIONALĂ DE SINTEZĂ A NANOPRECURSORILOR FERITICI ȘI FERITEI PE BAZĂ DE COBALT

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Abstract: Some aspects about the synthesis and structure of cobalt oxalato-hydrazinate and the corresponding ferrite are discussed in this paper. Ultrafine cobalt ferrite has been prepared by the decomposition of cobalt oxalate-hydrazinate complex, which is used as precursor. For cobalt oxalate-hydrazinate it was established the chemical composition, spectral properties and thermal behaviour to determine the conditions for ferrite powder synthesis. Some comparative results confirmed the formation of spinelic ferrite, at 500 °C.