

# CONTENTS

## Metalurgia International 11/2008

ISSN 1582 – 2214

### MATERIALS SCIENCE RESEARCH AND DEVELOPMENT .....5-71

*GHIBAN BRÂNDUȘA, GHIBAN NICOLAE, SERBAN NICOLAE, SEMENESCU AUGUSTIN:*

**The silicon alloying thermodynamics in the austenitic stainless steels.....5-12**  
*JUHASZ IOZSEF, HOTEA VASILE, POP ELENA, BANCILA-AFRIM NICOLAE, SMICAL IRINA:*

**Experimental results concerning the electrolyte purification process from the copper electrolytic refinement.....13-18**  
*MITOȘERIU OLGA, COCINDĂU SANDA CIREȘICA, POTECAȘU FLORENTINA, ORAC LUCICA:*

**Composite coatings obtained through zinc electrochemical codeposits and short ceramic fibres.....19-26**  
*AXINTE CRINA, CHIRITA BOGDAN, CRISTEA ION, SCHNAKOVSKY CAROL :*

**Optimization procedure for the springback reduction in sheet metal forming.....27-34**  
*POTECAȘU FLORENTINA, MITOȘERIU OLGA, DRUGESCU ELENA, VLAD MARIA:*

**The structure of composite deposition with nickel matrix.....35-41**  
*VLAD MARIA, GAITA MIHAI:*

**Correlation between polarisation voltage and the properties of tin films deposited on steel base.....42-47**  
*SOCALICI ANA, ARDELEAN ERIKA, HEPUT TEODOR, ARDELEAN MARIUS:*

**Experimental researches meant to improve the quality of continuous cast semi-finished sections....48-56**  
*MILOȘTEAN DANIELA CĂTĂLINA, ILCA IOAN:*

**Studies on the semisolid state die-casting in the presence of mechanical vibrations.....57-62**  
*IVĂNUȘ DANIELA:*

**Research regarding the metallic ions from the peloid sediments in the process of ion exchange ...63-71**

### ECONOMIC AND FINANCIAL MANAGEMENT. ACCOUNTANCY IN METALLURGY .....72-104

*PÎRNĂU MIRONELA:*

**General aspects regarding the cyc language – applications for the artificial intelligence.....72-76**

*CARAIANI PETRE:*

**A multisectoral dsge model for Romania...77-85**

*CARAIANI GHEORGHE:*

**Ethics in china’s business environment.....86-92**

*LEPĂDATU GHEORGHE V., NICULA ILEANA :*

**Financial instruments in accounting management modern.....93-99**  
*CHIȚIBA CONSTANȚA-AURELIA, OLARU OCTAVIAN-LIVIU:*

**Foreign trade promotion activity, a key issue for the romania’s efficient participation within the global international system.....100-104**

**FOSECO Turbostop system – reference list..... I-II**

**New books, published by Romanian Metallurgical**

**Foundation.....III-IV**

### DATA BASES

E According to paragraph 2.6 of license agreement between EBSCO Publishing Inc. (U.S.A.) and FUNDAȚIA METALURGIA ROMÂNĂ (ROMÂNIA) the journals METALURGIA and METALURGIA INTERNATIONAL are included in EP Products, starting from July 1<sup>st</sup>, 2006.

E These journals are included on EBSCO’s site: [www.elsevier.com](http://www.elsevier.com), chapter „Computers and Applied Sciences Complete”, positions 1026 and 1027.

E Starting from January 1<sup>st</sup>, 2007 the journal METALURGIA INTERNATIONAL is also in the SCOPUS database, belonging to ELSEVIER BIBLIOGRAPHIC DATABASES – Amsterdam (Netherlands).

E We inform our authors and readers that now our magazine “METALURGIA INTERNATIONAL” is introduced in THOMSON SCIENTIFIC MASTER JOURNAL LIST, letter M, position 400. For next information please access [www.isinet.com](http://www.isinet.com) position <http://scientific.thomson.com/cgi-bin/jrnlist/jresults.cgi>

METALURGIA INTERNATIONAL is evaluated by Romanian Council for Research and Development in Universities into category “A” (see CNCIS Website).

E The publisher is honoured to inform the readers and authors that beginning with volume 12 (2007), METALURGIA INTERNATIONAL is indexed and abstracted in the following:

- Science Citation Index Expanded (also known as Sci Search\*)
- Journal Citation Reports/Science Edition

These elements represent Thomson Reuters products and custom information services.

E THE BRITISH LIBRARY – Londra (Anglia), starting from year 2008

1. The “METALURGIA INTERNATIONAL” magazine receives manuscripts of papers including basic scientific research and industrial research in the following fields: metallurgy, materials science and engineering and different relating processes.
2. Original papers not previously publishing in any other journal, or not sent for publishing before, are accepted.
3. After publication, the copyright is transferred to the publishing house.
4. Every manuscript will be referred, their reports form the basis of the Editor’s decision.

5. The manuscripts sent to the Editor will not returned to the author, even they are not published.

6. The manuscripts will be sent to the following address:

**METALURGIA INTERNATIONAL**

**83, Calea Griviței, sector 1, Postal code 010705, postal office 12**

**Bucharest, Romania**

**Tel.: +(40)-021-310 71 38; +(40)-021-0722 665 071;**

**Fax: +(40)-021-310 71 38**

**E-mail: [redactia@metalurgia.ro](mailto:redactia@metalurgia.ro); See also web: [www.metalurgia.ro](http://www.metalurgia.ro)**

REDACTION

# ABSTRACT

## Metalurgia International 11/2008

### MATERIALS SCIENCE RESEARCH AND DEVELOPMENT .....5-71

#### D.C.

**Keywords:** intergranular corrosion, stainless steel, thermodynamic activity, silicon alloying.

GHIBAN BRĂNDUȘA, GHIBAN NICOLAE, SERBAN NICOLAE, SEMENESCU AUGUSTIN:

#### The silicon alloying thermodynamics in the austenitic stainless steels

In this paper, the authors analyse the corrosion processes from thermodynamic point of view for eight types of austenitic stainless steels. It has been determinate the maximum temperature at which the intergranular corrosion appears in the silicon alloyed stainless steels only from thermodynamic considerations and also the influence of the silicon content in the presence of carbon in stainless steels.

**Metalurgia International 2008, no. 11, p. 5**

#### D.C.

**Keywords:** electrolytic refinement, secondary copper, residuum, electrolyte. JUHASZ IOZSEF, HOTEA VASILE, POP ELENA, BANCILA-AFRIM NICOLAE, SMICAL IRINA:

**Experimental results concerning the electrolyte purification process from the copper electrolytic refinement** In this paper there are presented the experimental results obtained in the electrolyte purification process from the copper electrolytic refinement. The impurities behaviour in the purification process has been set apart through microstructural analyses SEM, chemical microanalyses EDAX and composing image, and also through optical emission spectrometry.

**Metalurgia International 2008, no. 11, p. 13**

#### D.C.

**Keywords:** electrodeposition, composite, zinc-matrix, ceramic fibres. MITOȘERIU OLGA, COCINDĂU SANDA CIREȘICA, POTECAȘU FLORENTINA, ORAC LUCICA:

#### Composite coatings obtained through zinc electrochemical codeposits and short ceramic fibres

Advantage of the composite materials obtained through the electrodeposition method are: to accomplish an adequate structural and characteristics, facility to obtain a regular and adherent surface, low costs, possibility to automate and adjust the technology process, excluding other following mechanical processes. Thus covering composites have better characteristics such as: hardness degree, anti-friction behaviour, anticorrosive and wear resistance.

It was shown that the electrodeposition composite was obtained from the sulfate solution and ceramic fibers (from binary system  $Al_2O_3-SiO_2$ ), at environment temperature. The role of including short ceramic fibers in zinc matrix is to improve the covering stability at the industrial corrosion.

**Metalurgia International 2008, no. 11, p. 19**

#### D.C.

**Keywords:** springback, optimization procedure, LMecA method. AXINTE CRINA, CHIRITA BOGDAN, CRISTEA ION, SCHNAKOVSKY CAROL:

**Optimization procedure for the springback reduction in sheet metal forming** This work deals with the problem of springback in sheet metal forming. The main objective is the establishment of a method that must permit to identify an optimum relation between the process parameters, geometry of tool and material parameters, so that the effects of springback on the shape and dimensional accuracy of the obtained part to be minimum. In this sense, an optimization procedure based on the LMecA method is presented.

**Metalurgia International 2008, no. 11, p. 27**

#### D.C.

**Keywords:** microstructure, composite coatings, complementary phase, nickel matrix. POTECAȘU FLORENTINA, MITOȘERIU OLGA, DRUGESCU ELENA, VLAD MARIA:

**The structure of composite deposition with nickel matrix** The composite coatings can be deposited by certain techniques, on different metallic or non-metallic materials, as new perspectives are opened toward obtaining the protective coatings with superior properties on classic, usual materials. The composite coatings are a particular case of the composite materials. The structure and composition of the coatings, as well as their bond with the support material greatly influences its properties.

The paper presents the structure of some composite coatings with the nickel matrix, obtained through electrochemical methods, using as a complementary phase carbides and oxide particles ( $Al_2O_3$ ,  $ZrO_2$ ,  $B_4C$ ,  $SiC$ ) with contents of cca. 4-6%. The maintaining times in electrolyte ranged from 10 to 60 minutes. The macro and microstructural analysis had as objectives: the exterior aspect at composite depositions; the adherence of the film deposited at the support; the width of the deposition; the film compactness; the size, shape and orientation of the grains in the deposited layer; the distribution of the disperse phase in the metallic matrix.

**Metalurgia International 2008, no. 11, p. 35**

### ATTENTION!

E According to paragraph 2.6 of license agreement between EBSCO Publishing Inc. (U.S.A.) and FUNDAȚIA METALURGIA ROMÂNĂ (ROMÂNIA) the journals METALURGIA and METALURGIA INTERNATIONAL are included in EP Products, starting from July 1<sup>st</sup>, 2006.

E These journals are included on EBSCO's site: [www.ebscohost.com](http://www.ebscohost.com), chapter „Computers and Applied Sciences Complete”, positions 1026 and 1027.

E Starting from January 1<sup>st</sup>, 2007 the journal METALURGIA INTERNATIONAL is also in the SCOPUS database, belonging to ELSEVIER BIBLIOGRAPHIC DATABASES – Amsterdam (Netherlands).

E We inform our authors and readers that now our magazine “METALURGIA INTERNATIONAL” is introduced in THOMSON SCIENTIFIC MASTER JOURNAL LIST, letter M, position 400. For next information please access [www.isinet.com](http://www.isinet.com) position <http://scientific.thomson.com/cgi-bin/jrnlst/jlresults.cgi>

E METALURGIA INTERNATIONAL is evaluated by Romanian Council for Research and Development in Universities into category “A” (see CNCISIS Website).

E The publisher is honoured to inform the readers and authors that beginning with volume 12 (2007), METALURGIA INTERNATIONAL is indexed and abstracted in the following:

- Science Citation Index Expanded (also known as Sci Search\*)
- Journal Citation Reports/Science Edition

These elements represent Thomson Reuters products and custom information services.

E THE BRITISH LIBRARY – Londra (Anglia), starting from year 2008



Romanian Metallurgical Foundation  
Scientific Publishing House

# ABSTRACT

## Metalurgia International 11/2008

<p><b>MATERIALS SCIENCE RESEARCH AND DEVELOPMENT .....5-71</b> D.C. <b>Keywords:</b> microstructure, composite coatings, complementary phase, nickel matrix <b>VLAD MARIA, GAITA MIHAI:</b> <b>Corelation between polarisation voltage and the properties of tin films deposited on steel base</b> The hardness thin films on pieces and tools through Physical Vapour Deposition (PDV) method knew a permanent and constant spreading owing to the great applicability of the resulting coatings which make that films deposited from the vapour stage to become a strategically method. The control of the properties of the TiN film deposited on steel, by means of the deposition parameters, calls for deeper researches as regards the effect of the film polarisation voltage on the mechanical properties, adherence and the relationship between such properties and wear resistance. In the paper have been studied layer thickness, hardness, contraction, aliation, friction coefficient, depending on the polarisation voltage (<math>U_1=140V</math>, <math>U_2=140V</math>). The effect of substrate polarisation voltage on the wear resistance has been investigated by means of drilling tests and effect of polarisation voltage on performances substrate at polarisation tension (BIAS) of 200V, 300V, 400V. <b>Metalurgia International 2008, no. 11, p. 42</b> D.C. <b>Keywords:</b> Steel. Continuous casting. Solidification. Structure. Micro-coolers. <b>SOCALICI ANA, ARDELEAN ERIKA, HEPUT TEODOR, ARDELEAN MARIUS:</b> <b>Experimental researches meant to improve the quality of continuous cast semi-finished sections</b> The work presents the results obtained from industrial experimentations made for quality improvement of the semi-finished continuously cast product. The researches emphasize how the additions of micro-coolers in the steel continuous casting crystallizer are influence of the solidification phenomenon of the semi-finished product continuously cast, type (270x240mm) bloom. The application of steel continuously casting technology with addition of micro-coolers in the crystallizer, don't presupposes major investments, is easy to adapt for any installation of steel continuous casting equipment. The proposed technology can be successfully used in case which the steel temperature in crystallizer is toward the higher prescribed limit with positive effects about quality of the semi-finished continuously cast product directing to the effect about the cast structure. Through the made experimentations is increased the investigatory area in the field of continued cast steel, conducting of solidification process of this through micro-coolers utilization is recent, thus that output research will conduct to the clarification of related aspects due to solidification casting semi-finished product. <b>Metalurgia International 2008, no. 11, p. 48</b> D.C. <b>Keywords:</b> semisolid, mechanical vibration, steel, microstructure.. <b>MILOȘTEAN DANIELA CĂTĂLINA, ILCA IOAN:</b> Studies on the semisolid state die-casting in the presence of mechanical vibrations <i>In this work, the studied steel is subject to semisolid state die-casting in the presence of mechanical vibrations with a frequency of maximum 40Hz, the vibrations being applied during the entire process.</i></p>	<p><i>The experimental results show that the mechanical vibrations can tear the dendrites growing from the walls of the die towards the centre, during solidification. Therefore a globulisation of the grains occurs; even more, the mechanical vibrations decrease the quantity of defects such as: inclusions and micropores. The energy absorbed through tearing for the steel studied registers a rather significant increase with the increase of the value of the product between the square frequency and amplitude.</i> <b>Metalurgia International 2008, no. 11, p. 57</b> D.C. <b>Keywords:</b> metallic ions, peloid sediment, ion exchange <b>IVĂNUȘ DANIELA: Research regarding the metallic ions from the peloid sediments in the process of ion exchange</b> This study takes into consideration, besides the water from Ionele-Urzicuța Lake, the Dolj County, the vegetable slime sediments from this lake and it establishes its properties as an ion exchanger which are very important in some therapeutic treatments. The properties of these sediments have been compared to well-known therapeutic sediments, the most important conclusion being that there are many resemblances between these sediments and those from Techirghiol, whose therapeutic properties are well known. Connections between such a treatment and complementary factors would bring benefits both as far as the study of this area and the people's health are concerned. <b>Metalurgia International 2008, no. 11, p. 63</b></p> <p><b>ECONOMIC AND FINANCIAL MANAGEMENT. ACCOUNTANCY IN METALLURGY .....72-104</b> D.C. <b>Keywords:</b> natural language, data base, knowledge base, HTML <b>PÎRNĂU MIRONELA:</b> <b>General aspects regarding the cyc language –applications for the artificial intelligence</b> Computerized information are stocked in many forms, including those dates which are structured (data bases), mid structured (calculus pages, WEB pages) and unstructured (text folders or text fields). CYC can transform the information in useful knowledge. CYC treat each registration in a data base as if this would be an implicit statement done in a data base. These statements are then available during the deduction process. In a similar way, the text fields can be read by using the processor of the natural language to see whether they contain useful statements. The statements sometimes describe what the "text" is about. CYC can use the information to localize and to report any information that the user could use to answer to a certain examination. The CYC upper ontology represents a large, publicly available "theory of everything." In order to effectively translate the CYC upper ontology into a Java object model, a production system can be used. The task becomes easier if used an intermediate target language. <b>Metalurgia International 2008, no. 11, p. 72</b></p>
--	---

### ATTENTION!

E According to paragraph 2.6 of license agreement between EBSCO Publishing Inc. (U.S.A.) and FUNDAȚIA METALURGIA ROMÂNĂ (ROMÂNIA) the journals METALURGIA and METALURGIA INTERNATIONAL are included in EP Products, starting from July 1<sup>st</sup>, 2006.

E These journals are included on EBSCO's site: [www.ebscohost.com](http://www.ebscohost.com), chapter „Computers and Applied Sciences Complete”, poztions 1026 and 1027.

E Starting from January 1<sup>st</sup>, 2007 the journal METALURGIA INTERNATIONAL is also in the SCOPUS database, belonging to ELSEVIER BIBLIOGRAPHIC DATABASES – Amsterdam (Netherlands).

E We inform our authors and readers that now our magazine “METALURGIA INTERNATIONAL” is introduced in THOMSON SCIENTIFIC MASTER JOURNAL LIST, letter M, position 400. For next information please access [www.isinet.com](http://www.isinet.com) position <http://scientific.thomson.com/cgi-bin/jrnlst/jlresults.cgi>

E METALURGIA INTERNATIONAL is evaluated by Romanian Council for Research and Development in Universities into category “A” (see CNCSIS Website).

E The publisher is honoured to inform the readers and authors that beginning with volume 12 (2007), METALURGIA INTERNATIONAL is indexed and abstracted in the following:

- Science Citation Index Expanded (also known as Sci Search\*)
- Journal Citation Reports/Science Edition

These elements represent Thomson Reuters products and custom information services.

E THE BRITISH LIBRARY – Londra (Anglia), starting from year 2008



Romanian Metallurgical Foundation  
Scientific Publishing House

# ABSTRACT

## Metalurgia International 11/2008

<p><b>ECONOMIC AND FINANCIAL MANAGEMENT. ACCOUNTANCY IN METALLURGY</b> .....72-104</p> <p><b>D.C.</b> <b>Keywords:</b> DSGE models, monetary policy, simulations, econometric methods CARAIANI PETRE: <b>A multisectoral dsge model for Romania</b> In this study I calibrate a multi-sectoral model for Romanian economy. The model is an extension of the standard New Keynesian model with sticky prices and one sector. Calibration was based on both the results of previous estimations of DSGE models for Romanian economy and on the National Accounts data regarding economic sectors. The results show that the economic sectors respond in a different way to the shocks that influence the aggregate economy. The services sector is the least sensitive to the monetary shocks. This result is in agreement with the economic theory regarding the services sector, but also with the empirical results regarding the behavior of the services along the economic cycles. The constructions sector is the most sensitive to the monetary shocks, confirming the high volatility of this sector along the business cycles. The inflationary shocks in the services sector have the strongest impact on aggregate inflation. <b>Metalurgia International 2008, no. 11, p. 77</b></p> <p><b>D.C.</b> <b>Keywords:</b> DSGE models, monetary policy, simulations, econometric methods CARAIANI GHEORGHE: <b>Ethics in china's business environment</b> In the last three decades the most dynamic economy of the entire world has been and continues to be the holder of the world record the People's Republic of China. In the last decades no other country has had such a long period and medium annual development rhythm so high of about 10% such as China. The healthy and strong increase of Chinese economy has created a base for setting prices and the course of the national currency, the Yuan accounted to the U.S. dollar and other convertible currencies, benefic aspects for the economy and the lives of Chinese people. <b>Metalurgia International 2008, no. 11, p. 86</b></p>	<p><b>D.C.</b> <b>Keywords:</b> Financial statements, balance sheet, income statements, cash flow statement, IAS/IFRS LEPĂDATU GHEORGHE V., NICULA ILEANA : <b>Financial instruments in accounting management modern</b> The provision of transparent and useful information on market participants and their transaction is essential for an orderly and efficient market, and it is one of the most important preconditions for imposing market discipline. Left to themselves, markets may not generate sufficient levels of disclosure. Market forces would normally balance the marginal benefits and marginal costs of additional information disclosure and the end result may not be what the market participants really need. <b>Metalurgia International 2008, no. 11, p. 93</b></p> <p><b>D.C.</b> <b>Keywords:</b> foreign trade promotion, world economy, efficiency CHIȚIBA CONSTANȚA-AURELIA, OLARU OCTAVIAN-LIVIU: <b>Foreign trade promotion activity, a key issue for the romania's efficient participation within the global international system</b> In the actual world economy framework, foreign trade promotion activity has to represent for each country one of the most important components of the national economy development strategy. A recent survey issued by the International Trade Centre UNCTAD/WTO estimated that the budgets for public trade promotion programmes, alone, amount to an average order of magnitude of 0.1% of national exports per year. For every country, including Romania, this activity has to be developed in keeping with the provisions of the international agreements in which they are signatory parts, as well as with the international market rules and procedures. In this respect, Romanian governmental officials, as well as the representatives of the business community agree the fact that after the Romania's accession within EU, export promotion activity should be one of the most important factors in fostering exports and for changing Romania's image at the international level. <b>Metalurgia International 2008, no. 11, p. 100</b></p>
--	--

### ATTENTION!

- E According to paragraph 2.6 of license agreement between EBSCO Publishing Inc. (U.S.A.) and FUNDAȚIA METALURGIA ROMÂNĂ (ROMÂNIA) the journals METALURGIA and METALURGIA INTERNATIONAL are included in EP Products, starting from July 1<sup>st</sup>, 2006.
- E These journals are included on EBSCO's site: [www.ebscohost.com](http://www.ebscohost.com), chapter „Computers and Applied Sciences Complete”, positions 1026 and 1027.
- E Starting from January 1<sup>st</sup>, 2007 the journal METALURGIA INTERNATIONAL is also in the SCOPUS database, belonging to ELSEVIER BIBLIOGRAPHIC DATABASES – Amsterdam (Netherlands).
- E We inform our authors and readers that now our magazine “METALURGIA INTERNATIONAL” is introduced in THOMSON SCIENTIFIC MASTER JOURNAL LIST, letter M, position 400. For next information please access [www.isinet.com](http://www.isinet.com) position <http://scientific.thomson.com/cgi-bin/jrnlst/jlresults.cgi>
- E METALURGIA INTERNATIONAL is evaluated by Romanian Council for Research and Development in Universities into category “A” (see CNCIS Website).
- E The publisher is honoured to inform the readers and authors that beginning with volume 12 (2007), METALURGIA INTERNATIONAL is indexed and abstracted in the following:
- Science Citation Index Expanded (also known as Sci Search\*)
  - Journal Citation Reports/Science Edition
- These elements represent Thomson Reuters products and custom information services.
- E THE BRITISH LIBRARY – Londra (Anglia), starting from year 2008



Romanian Metallurgical Foundation  
Scientific Publishing House