



III.O.12

EFFECT OF WALNUT SHELL REINFORCEMENT ON POLYMER MATRIX COMPOSITES

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Keywords: Polymer matrix composite, mechanical properties, walnut shell waste, polyester

Abstract: Turkey produces exceeding 200,000 tons of walnut annually as the fourth largest producer in the world. The walnut shell amounts to 40-60% of the total weight rendering over 100,000 tons shell per year, mostly as waste. A limited quantity is utilized in the fiberboard manufacturing, as solid fuel, scrubbing material in the chemical and metal industries. The purpose of this study is the development of low cost polyester composites with enhanced mechanical properties by the incorporation of walnut cellulosic fibers as the reinforcing phase in the polyester resin. The process not only makes the production more economical but also reduces the amount of waste. The shells are ground and the detailed characterization of waste fibers is carried out by scanning electron microscopy, X-ray diffraction, laser diffraction and He gas picnometer techniques. The effects of the filler/matrix ratio and the particle size, shape and chemical treatment of walnut fibers on the physical and mechanical properties of the composite are determined. The composites are characterized by the porosity, density, three-point bending strength, impact resistance and hardness measurements. Structure-property relationship of developed composites was discussed.



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BOOK OF ABSTRACTS



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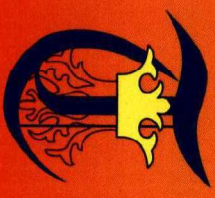
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“Welcome at TRANSILVANIA University of Brasov!”

CONTENT

PRELIMINARY PRESENTATIONS	7
PLENARY LECTURES	10
SECTION I – Metallic materials	20
SECTION II – Biomaterials	72
SECTION III – Ceramics, polymers and composite materials	99
SECTION IV – Surface engineering	145
SECTION V – Nanomaterials	184
SECTION VI – Welding engineering	225
SECTION VII – Safety engineering	242
SECTION VIII – Magnesium science and engineering	245
Index of authors	252



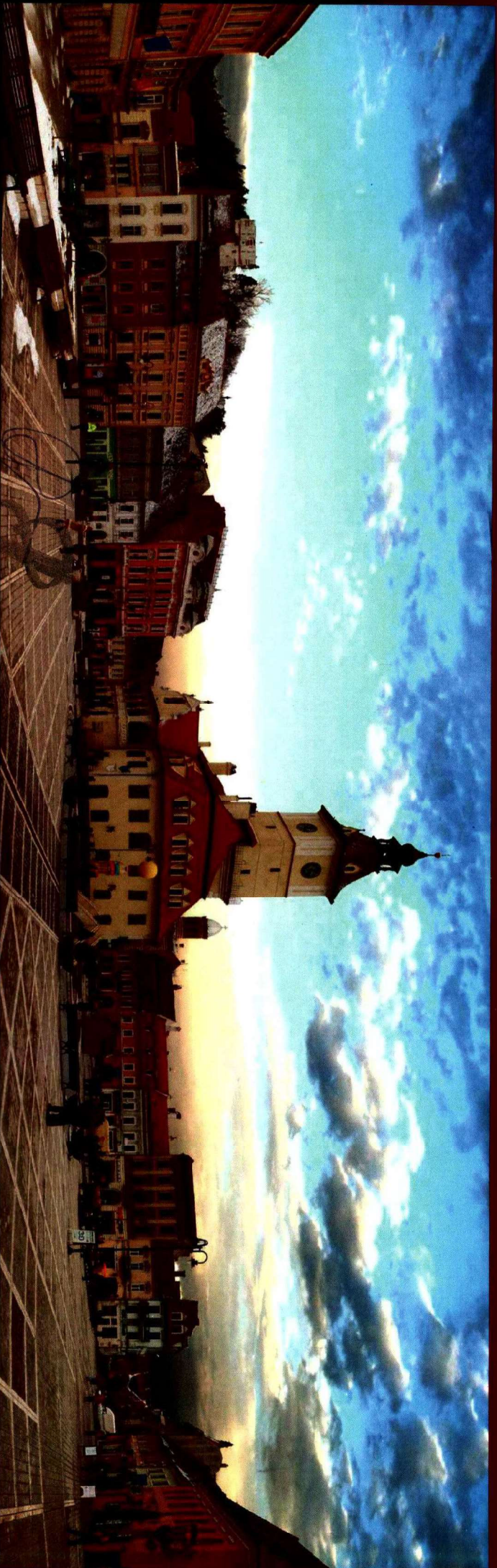
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Hall C

12.10: Oral Presentations IIb (Section II)

Chairpersons: **Iulian ANTONIAC**, University Politehnica of Bucharest, Romania
Camelia GABOR, Transilvania University of Brasov, Romania

12.10: II.O.1. Induced wettability and surface-volume correlation of composition for bovine bone derived hydroxyapatite particles

A. MAIDANIUC, S.I. VOICU, M. MICULESCU, A.C. MOCANU, I. PENCEA, C. ANDRONESCU, E. MATEI, I. CSAKI, Politehnica University of Bucharest, ROMANIA
T. MACHEDON-PISU, Transilvania University of Brasov, ROMANIA

12.25: II.O.2. Effect of sintering temperature on structure and properties of some new hydroxyapatite based composites for bone tissue engineering

C. TECU, L. DRAGOMIR, C. MILEA, A. ANTONIAC, I. ANTONIAC, University Politehnica of Bucharest, ROMANIA
M.G. GOK, G. GOLLER, Istanbul Technical University, TURKEY

12.40: II.O.3. Morphology and biocompatibility characterization of nanostructured TiO₂ surfaces for biomedical implants developed by electrochemical anodization

G. STRNAD, S. MOICA, Petru Maior University of Tirgu Mures, ROMANIA
D. PORTAN, University of Patras, GREECE
L. JAKAB-FARKAS, Sapientia University of Cluj Napoca, ROMANIA
C. PETROVAN, O. RUSSU, D. R. MANU, University of Medicine and Pharmacy, Tirgu Mures, ROMANIA

12.55: II.O.4. Corrosion behavior of biodegradable FeMnSi-MgCa alloy

F. SĂNDULACHE, S. STANCIU, R. CIMPOEȘU, B. ISTRATE, N. CIMPOEȘU, Gheorghe Asachi Technical University of Iasi, ROMANIA
C. TRINĂ, G. ZEGAN, "Ion Ionescu de la Brad" University of Agricultural Sciences and Veterinary Medicine, ROMANIA

13.10: II.O.5. Resveratrol covalent immobilization onto cellulose acetate membranes for improved osseointegration

S.I. VOICU, M.A. PANDELE, A. IORDACHE, F. MICULESCU, University Politehnica from Bucharest, ROMANIA
A.I. STARAS, P. NEACUSU, A. CIMPEAN, University of Bucharest, ROMANIA
V.K. THAKUR, University of Cranfield, School of Aerospace, Transport and Manufacturing, UNITED KINGDOM

Hall D

11.30: Oral Presentations IIc (Section III)

Chairpersons: **Rodica Mariana ION**, ICECHIM, Bucharest; Valahia University of Targoviste, ROMANIA
Cătălin CROITORU, Transilvania University of Brașov, ROMANIA

11.30: III.O.5. Eco efficient melting of ceramic frits

A. LÓPEZ-DELGADO, J.I. ROBLA, I. PADILLA, J. GARCÍA-HIERRO, National Centre for Metallurgical Research, Madrid, SPAIN
M. ROMERO, Eduardo Torroja Institute for Construction Sciences, Madrid, SPAIN

11.45: III.O.6. Soft magnetic composites based on hybrid coated Fe-Si nanocrystalline powders

B.V. NEAMTU, Technical University of Cluj-Napoca, ROMANIA
M. NASUI, Center for Superconductivity, Spintronics and Surface Science, Technical University of Cluj-Napoca, ROMANIA
T.F. MARINCA, F. POPA, I. CHICINAȘ, Technical University of Cluj-Napoca, ROMANIA

12.00: III.O.7. Characterization of thermoplastic bearings by using of horizontal rotational forming

P.A. POP, University of Oradea, ROMANIA
J. LOPEZ-MARTINEZ, Univesitat Politècnica de València, Alcoy-Alicante, SPAIN
I.M. GORDAN, University of Oradea, ROMANIA
S. FERRANDIZ-BOU, Univesitat Politècnica de València, Alcoy-Alicante, SPAIN
L.G. MITU, Transilvania University of Brasov, ROMANIA

12.55: V.O.4. Properties analysis of dextrane magnetic carrier compounds with potential applications in environmental and biomedical fields

A.M. PREDESCU, E. MATEI, A.C. BERBECARU, M.C. PANTILIMON, C.I. DRĂGAN, C. PREDESCU, C. GRĂDINARU,
University Politehnica of Bucharest, ROMANIA

13.10: V.O.5. Carbon coated metallurgical grade silicon decorated graphene anodes

G. HATIPOĞLU, *Sakarya University, Engineering Faculty, Dept. of Metallurgy and Materials Engineering and Tubitak, Marmara Research Center, Energy Institute, TURKEY*

M. ALAF, *Bilecik Seyh Edebali University, Engineering Faculty, Dept. of Metallurgy and Materials Engineering, Gulumbe Campus, TURKEY*

D. UZUN, *Tubitak, Marmara Research Center, Energy Institute, TURKEY*

H. AKBULUT, *Sakarya University, Engineering Faculty, Dept. of Metallurgy and Materials Engineering, Esentepe Campus, TURKEY*

13.30: Lunch

Hall B

15.00: Oral Presentations IIIa (Section I)

Chairpersons: Horia ALEXANDRU, Politehnica University of Bucharest, ROMANIA

Traian Lucian SEVERIN, "Stefan cel Mare" University of Suceava, ROMANIA

15.00: I.O.12. Effect of pre-straining and baking temperature on bake hardening behaviour of hot-dip galvanized steels

G. AYTan, Y. YUREKTURK, *Istanbul Technical University, Metallurgical and Materials Department, Istanbul, TURKEY*

M. BAYDOGAN, *Istanbul Technical University, Metallurgical and Materials Department, Istanbul, TURKEY*
Istanbul Technical University, Prof. Dr. Adnan Tekin Material Sciences and Production Technologies Applied Research Center, Istanbul, TURKEY

15.15: I.O.13. Estimating volume fractions of microstructural constituents in austempered high silicon alloyed GJS 600-10 ductile iron through magnetic measurements (VSM)

Y. YUREKTURK, *Istanbul Technical University, Metallurgical and Materials Department, Istanbul, TURKEY*

M. BAYDOGAN, *Istanbul Technical University, Metallurgical and Materials Department, Istanbul, TURKEY*
Istanbul Technical University, Prof. Dr. Adnan Tekin Material Sciences and Production Technologies Applied Research Center, Istanbul, TURKEY

15.30: I.O.14. Oxide nanomaterials: synthesis, mechanistic studies and technological innovation in wastewater treatment by flotation

C. COVALIU, G. PARASCHIV, *University Politehnica of Bucharest, ROMANIA*

C. MOGA, *S.C. DFR Systems S.R.L., Bucharest, ROMANIA*

M. MATACHE, *National Institute of Research-Development for Machines and Installations Designed to Agriculture and Food Industry, Bucharest, ROMANIA*

15.45: I.O.15. Formation of Al-Ti based phases for grain refinement of Al alloys produced by high energy ball milling

M. ARIKOĞLU, A. ÖZER, *Cumhuriyet University Metallurgical and Materials Engineering Department, Sivas, TURKEY*

16.00: I.O.16. Identification of the creep models parameters of the metallic materials using evolutionary algorithms

B. DELIKTAS, H.T. TÜRKER, *Uludag University, Civil Engineering Department, Bursa, TURKEY*

M. SÖNMEZ, *Aksaray University, Civil Engineering Department, Bursa, TURKEY*

A. DURMUS, *Uludag University, Civil Engineering Department, Bursa, TURKEY*

16.15: I.O.17. Analytical description of the bainite transformation kinetics in steels 300m and D6AC

A.A. KUKLINA, M.V. MAYSURADZE, Y.V. YDIN, *Ural Federal University named after the first President of Russia B.N. Yeltsin, Ekaterinburg, RUSSIA*

16.30: I.O.18. Concepts regarding the heat transfer and reduction of the energy consumptions at the metallurgical heating furnaces

D. CONSTANTINESCU, B.A. CĂRLAN, University Politehnica of Bucharest, ROMANIA

Hall D

15.00: Oral Presentations IIIb (Section III)

Chairpersons: Ionel CHICINAȘ, Technical University of Cluj-Napoca, ROMANIA
Liana Sanda BALTES, Transilvania University of Brașov, ROMANIA

15.00: III.O.13. Theoretical comparison between carbon fiber and graphene composites for automotive components

L. RAD, M. ADAM, A. CHIRU, Transilvania University of Brasov, ROMANIA

15.15: III.O.14. Life cycle cost comparison between steel, carbon fiber composites and graphene composites

L. RAD, M. ADAM, A. CHIRU, Transilvania University of Brasov, ROMANIA

15.30: III.O.15. Nanoparticle embedded mixed matrix PSF membranes characterization and membrane performance

S.C. PINTILIE, L.G. TIRON, A.L. LAZAR, S. BALTA, Dunarea de Jos University of Galati, ROMANIA

15.45: III.O.16. Optimal composition of mixed material for the thermoforming process

A. SONSIRI, P. PALICAMIN, Rajamangala University of Technology Krungthep, Bangkok, THAILAND

16.00: III.O.17. Effect of sequential milling (mechanical alloying-cryogenic milling) on the microstructural and mechanical properties of TiB₂ reinforced Al-12.6 wt.% Si MMCs

E. TEKOĞLU, S. MERTDİNÇ, D. AĞAOĞULLARI, M. L. ÖVEÇOĞLU, Istanbul Technical University, TURKEY

16.15: III.O.18. Analysis of flexural properties for metal/plastic composites made by a new hybrid process

J. BUTT, H. SHIRVANI, S. NAMMI, Anglia Ruskin University, Department of Engineering & Built Environment, Chelmsford, Essex, UNITED KINGDOM

Hall E

15.00: Oral Presentations IIIc (Section IV)

Chairpersons: Corneliu MUNTEANU, Technical University of Iasi, ROMANIA
Elena Manuela STANCIU, Transilvania University of Brasov, ROMANIA

15.00: IV.O.13. Effect of process parameters on the tribological properties of porcelain waste reinforced epoxy composites

N. ÇALIŞ AÇIKBAŞ, Bilecik Seyh Edebali University, Engineering Faculty, Dept. of Metallurgy and Materials Engineering, Bilecik, TURKEY

B. YAMAN, Eskisehir Osmangazi University, Engineering Faculty, Dept. of Metallurgy and Materials Engineering, Eskisehir, TURKEY

G. AÇIKBAŞ, Bilecik Seyh Edebali University, Vocational School, Metallurgy Program, Bilecik, TURKEY

15.15: IV.O.14. Induced superhydrophobic and antimicrobial character of zinc metal modified ceramic wall tile surfaces

S. ÖZCAN, Bilecik Seyh Edebali University, Engineering Faculty, Dept. of Chemical and Process Engineering, Bilecik, TURKEY

G. AÇIKBAŞ, Bilecik Seyh Edebali University, Vocational School, Metallurgy Program, Bilecik, TURKEY

N. ÇALIŞ AÇIKBAŞ, Bilecik Seyh Edebali University, Engineering Faculty, Dept. of Metallurgy and Materials Engineering, Bilecik, TURKEY

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