$$T = \frac{Wb}{m^2}$$

4th Global Conference on Material Sciences

Grand Park Lara
Convention Center
Lara – Antalya, Turkey
February 28 – 02 March 2019

Antalya, Turkey

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4th Global Conference on Material Sciencies
(GC-MAS 2019)

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KEYNOTES

Prof. Dr. Asaf Varol
Chair of Department of Software Engineering
College of Technology, Firat University (Turkey)

Keynote Title: "Digital Transformation"

Bio. He completed his German Language Education between 1972 and 1973 in Germany. He finished his Machine Engineering Training Course in 1975 in Kassel/Germany with the support of IAESTE grant. He completed his BSc. study at Firat University/Turkey where he was the honored student (highest GPA among students) at the Department of Mechanical Engineering, and he started his MSc. study at the Institute for Nuclear Energy of Istanbul Technical University (ITU) in 1977. He had started as an Engineer at ITU Research Reactor in 1978, and after finishing his master study he had begun to work as a Research Assistant at Firat University in 1979. Between 1981 and 1982 he completed his dissertation experiments at Karlsruhe University in Germany with DAAD scholarship and later earned his PhD from Karadeniz Technical University (KTU) in 1983. He joined academic studies in the field of Computer Systems at Indiana and Purdue Universities in the USA via World Bank scholarship. He was promoted to Associate Professor in Energy Education in 1991. He established first local University Television Broadcasting System at Firat University. This system has been broadcasting continually since 1991. He was appointed for the position of Director of Revolving Funds Management of Technical Education College between 1991 and 1996. In 1992, he joined Salford and Bradford Universities in UK for academic studies on computer aided education and design. In 1995, he was invited to Oklahoma State University in the USA to have studies on Vocational and Technical Education, and Informatics. He was promoted to "Full Professor" in the field of Computer Systems Education in 1997. He used DAAD scholarship to work on a project in the field of Robotics at Bremen University/Germany in 1998. Between 1998 and 1999, he took the charge to combine the revolving funds management at Firat University. Specifically, he prepared the regulations and directives related with revolving funds management.

He served as the member of National Informatics Committees at Higher Education Council of Turkey (HECT) between 1999 and 2002. Between 2000 and 2004 he was the founder Dean of Communication College. Between 2003 and 2005, he taught different courses titled Analysis-Engineering Systems, Advance Mechatronics, Pro/Engineer (Solid Modeling), and Statics at West Virginia University in the USA. He was the founder vice president of Siirt University between 2007 and 2008. He held also the Dean of College of Education at Siirt University at the same time. He was Firat University's coordinator for the "East Anatolia Development Project" that supported by Ministry of Development of Turkey between 1998 and 2001. Prof. Dr. Asaf Varol was the Director of the Revolving Funds Management of Firat University between 2008 and 2012. He has been serving as the Chair of Software Engineering Department at Firat University since 2011. He taught Introduction to Digital Forensics and Information Assurance Course at Sam Houston State University in Fall 2013. He is the founder of the Department of Digital Forensics Engineering at Firat University that is the still unique and first in Turkey. He has established a dual degree program between Firat University and Sam Houston State University in 2012. He is the founder of the Association of Software and Cyber Security in Turkey (http://www.softcybersec.org) which aims to create and develop national software for up-to-date technologies and to defense country against cyber-attacks. He was founder of the International Symposium on Digital Forensics and Security (http://www.isdfs.org) in 2013. This symposium is organized by consortiums members of Sam Houston State University (SHSU-US), University of Arkansas at Little Rock (UALR-US), San Diego State University (US), Youngstown State University (US), Petru Maior University, Romania; Politechnic Institute of Cavado and Ave, Portugal, Firat University (TR), Gazi University (TR), Hacettepe University (TR), Balikesir University (TR), Baskent University (TR), HAVELSAN (TR), and Arab Open University (Lebanon). This symposium has been supported by IEEE since 2016. He was elected as External Quality Examiners of Higher Education Council of Turkey in 2017 and he evaluated the education system of Abant İzzet Baysal University in 2017. He graduated from the Master program in Public Administration at Sam Houston State University on May 13th, 2017. He is fluent in English and German languages. He is married to Nurhayat and have two sons with three grandchildren. He has published more than 300 journal papers, books, proceedings, and he has been a columnist at BT/Haber and Gunisigi Newspapers since 1997 where he has a dedicated column.

Prof. Dr. Osman Adıgüzel
Department of Physics, Firat University, 23169 Elazig, Turkey

Keynote Title: "Physical Aspects and Nanoscale Characterization of Successive Transformations in Shape Memory Alloys"

Bio; Dr. Osman Adiguzel was born in 1952, Nigde, Turkey. He graduated from Department of Physics, Ankara University, Turkey in 1974 and received PhD- degree from Dicle University, Diyarbakir-Turkey in Solid State Physics with experimental studies on diffusion less phase transformations in Ti-Ta alloys in 1980. He studied at Surrey University, Guildford, UK, as a post-doctoral research scientist in 1986-1987, and his studies focused on shape memory alloys. He worked as research assistant, 1975-80, at Dicle University, Diyarbakir, Turkey. He shifted to Firat University in 1980, and became professor in 1996, and He has already been working as professor. He published over 45 papers in international and national journals, He joined over 60 conferences and symposia in international and national level with contributions of oral or poster, and He supervised 5 PhD- theses and 3 M.Sc. theses. Dr. Adiguzel served his directorate of Graduate School of Natural and Applied Sciences, Firat University in 1999-2004. He received a certificate which is being awarded to him and his experimental group in recognition of significant contribution of 2 patterns to the Powder Diffraction File – Release 2000. The ICDD (International Centre for Diffraction Data) also appreciates cooperation of his group and interest in Powder Diffraction File. Scientific fields of Dr. Adiguzel are as follow: Martensitic phase transformations and applications to copper-based shape memory alloys, molecular dynamics simulations, alloy modeling, x-ray diffraction, and electron microscopy.

Abstract: Shape memory alloys are stimulus responsive materials and take place in the class of smart materials exhibiting a peculiar property called shape memory effect. Thermal and stressing processes govern shape memory effect in bulk level in physical basis. Shape memory behaviour is performed thermally in a temperature interval on heating and cooling after deformation in low temperature phase condition. The origin of this phenomenon lies in the fact that the material changes its internal crystalline structure with changing temperature, by means of crystallographic transformations. Successive crystallographic transformations, thermal induced and stress induced martensitic transformations govern this behaviour in nanometer scale, with twinning and detwinning processes in crystallographic basis. Thermal induced martensitic transformation occurs as martensite variants with lattice twinning in atomic scale, in materials on cooling below martensite finish temperature. Twinned martensite structures turn into detwinned martensitic structure by means of stress induced transformation by stressing material in martensitic condition. Twinned structures can be easily deformed through variant reorientation/detwinning process, in low temperature condition. Therefore, martensite is called soft phase and austenite is also called hard phase. Thermal induced martensitic transformation is lattice-distorting phase transformation and occurs as martensite variants with the cooperative movement of atoms by means of shear-like mechanism. Martensitic transformations occur by two or more lattice invariant shears on a {110}-type plane of austenite matrix which is basal plane or stacking plane for martensite, as a first step, and the transformed region consists of parallel bands containing alternately two different variants. In these alloys, the lattice of high temperature austenite phase has higher crystallographic symmetry than that of the low-temperature product phase.

Copper based alloys exhibit this property in metastable β-phase region, which has bcc-based high temperature parent phase structures martensitically turn into the complex stacking ordered structures with lattice twinning reaction on cooling. Lattice invariant shears are not uniform in copper-based shape memory alloys, and the ordered parent phase structures martensiticaly undergo the non-conventional complex layered structures on cooling. The long-period layered structures can be described by different unit cells, depending on the stacking sequences on the close-packed planes of the ordered lattice. The close-packed planes exhibit high symmetry and short-range order as parent phase. The unit cell and periodicity is completed through 18 layers in direction z, in case of 18R martensite, and unit cells are not periodic in short range in direction.

In the present contribution, x-ray diffraction and transmission electron microscope studies were carried out on two copper based CuZnAl and CuAlMn alloys. These alloy samples have been heat treated for homogenization in the β-phase fields. X-ray diffraction profiles and electron diffraction patterns reveal that both alloys exhibit super lattice reflections inherited from parent phase due to the displacive character of martensitic transformation. X-ray diffractograms taken in a long-time interval show that diffraction angles and intensities of diffraction peaks change with the aging time at room temperature, In particular, some of the successive peak pairs providing a special relation between Miller indices come close each other, and this result leads to the rearrangement of atoms in diffusive manner.

Prof. Dr. Joaquim Jorge
Department of Informatic, University of Lisbon
Editor-in-Chief, Computers & Graphics *(Indexed in SCI)*

Bio: Joaquim Jorge is Full Professor of Computer Science at Instituto Superior Técnico (IST/UTL), the School of Engineering of the Technical University of Lisboa, Portugal, where he teaches User Interfaces and Computer Graphics. He received PhD and MSc degrees in Computer Science from Rensselaer Polytechnic Institute, Troy, NY, in 1995 and a BsEE from IST/UTL in 1984. He was co-chair of Eurographics'98, which took place in Lisboa, Portugal. He has served as **general chair or program chair** for many conferences, including International Conference on CAD/Computer Graphics 2013 (Hong Kong), IUI 2012, INTERACT 2011, ECCE'2008 (Funchal, Madeira), CAe2008 (Portugal), WSCG 2006 (Plz, Czech Republic – program co-chair), EGVE'06 and EUROVIS'06 (Lisbon, Portugal May 2006) and EG SBM'05 (Dublin, September 05), SBM'04 (Grenoble, France, September 04), EGMM04 (Nanjing, PRC, October 04) Workshops and EG MM01 (Manchester 2001). A long-time practitioner of Computer Graphics, he first joined the Eurographics Association (EG) in 1986, helped organize the first Portuguese Computer Graphics Meeting in 1988 and was a founding member of the Eurographics Portuguese Chapter. He leads the EG Working Group on Sketch-Based Interfaces and Modeling, served on the EG Promotions Board from 2002 to 2006, on the EG Publications Board from 1997 to 2000, was EG Conference Monitoring Officer for EG2001 and was elected member of the Associations' Executive Committee from 2000 to 2006. He also serves on the Steering Committees of Expressive Graphics, Computational Aesthetics and NPAR (Non-Photorealistic Animation and Rendering) conference series.
He was invited as proposal evaluator for the ITR program of the National Science Foundation in 2000, 2001 and 2003 and EU's IST Fifth framework program, EUREKA and related consultation meetings on many different occasions. He has been a member of several research projects both at the National and European Level, Including MAXIMUS, IMPROVE and Eurotooling 21 research projects. He was Principal Investigator (PI) of the Smart Sketches (IST-2000-28169) project, and led the Alfa INETGAM II-0072-A network of excellence, both started in 2001. He also leads the CGEMS international project, co-funded by the EC Eurographics and SIGGRAPH Associations since September 2002. He participated in several European projects connected to graphics and graphics standardization efforts as a researcher with the Portuguese Computer and Systems' Engineering Institute (INESC) CAD/CAM group from 1984 to 1989. He was a consultant with FhG/IGD in Multimodal Interfaces (1999). He serves or has served on the program committees of over 170 international conferences. Since 2007 he is Editor in Chief of *Computers & Graphics Journal* and serves or has served on the board board for six other international journals. He is affiliated with ACM (Distinguished Member since 2017, Senior Member since 2007) / SIGGRAPH since 1989, IEEE Computer Society

(Senior Member since 2000), IAPR, and was chairman of the Eurographics Portuguese Chapter from 2000-2008. He served as IFIP TC13 (Human Computer Interaction) National Representative from 2000 to 2013. He served on the ACM/SIGGRAPH Educational Committee since 2004-2011 and Small Conferences Committee since 2008. He has also served on the EG Education Board since its inception in 2001. Since Juy 2014 he is Chair of the ACM SIGGRAPH Specialized Conferences Committee. He is an ACM Distinguished Speaker since 2015 and a Member of the ACM Europe Council since 2015. Joaquim Jorge's interests are in Calligraphic and Multimodal User Interfaces, Visual Languages and Pattern Recognition techniques applied to Human-Computer Interaction. He is author or co-author of over 260 papers published in peer-reviewed international conferences and publications. He was elected Fellow of the Eurographics Association in 2010. In 2014 he was given the IFIP Silver Core Award for his services to IFIP TC13.

Prof. Dr. Ahmet KAÇAR
Kastamonu University
Faculty of Education, Kastomonu,
Turkey

Keynote Title: "Matematik ve Sanat. Matematik ve Sanat İlişkisine Matematik Eğitimi Açısından Bir Bakış"

"Mathematics and Art. A View from the Perspective of Mathematics Education to Mathematics Education"

Bio: Ahmet Kaçar was born in Kastamonu, Turkey. He received the Bachelor of Science degree in Mathematics in 1984, the Master of Science degree in applied mathematics in 1986 and the Doctor of Philosophy degree in applied mathematics in 1990 from Ataturk University, Erzurum, Turkey. In 1990 he was an Assistant Professor and lectured at Mathematics Department of Atatürk University until 1995 in which he joined the Department of Mathematics Education, Kastamonu School of Education, Gazi University, Turkey, as lecturer and researcher. He became an Associate Professor in 1999 and a Professor in 2005. He is the author of papers and books in mathematics and mathematics education. His research interests are applied mathematics in mathematics; teacher education and elementary mathematics education in mathematics education.

Ahmet KAÇAR is currently the Professor of the Mathematics Education Department and Dean of Arts and Dizayn Faculty of Kastamonu University. He serves as the Editor of Kastamonu University Kastamonu Education Journal since 1997.

Abstracts

An EBSD examination of microstructure and microstexture evolution of hot deformed and annealed WE54 alloy

Hiba Azzeddine, Department of Physics, University of Mohamed Boudiaf

Samia Tighiouaret, Department of Physics, University of Mohamed Boudiaf

Djamel Bradai, Faculty of Physics, University of Sciences and Technology Houari Boumediene

Abstract

Magnesium (Mg) and its alloys have increasingly attracted scientific investigations because of potential applications in the aerospace and transportation industries due to their low density, high specific strength and attractive environmental characteristics. Nevertheless, Mg based alloys suffer from poor formability at low temperatures because of their hexagonal crystallography and the consequent lack of sufficient independent slip systems. Several strategies have been proposed to overcome this deficiency. The modification of the chemical composition of Mg based alloys with special addition of rare earth (RE) elements such as yttrium (Y), neodymium (Nd) and cerium (Ce) may potentially lead to improvements in the plastic formability as well as influencing the texture evolution of Mg-RE alloys. Mg based alloys containing both Nd and Y (WE-alloys) are interesting as light structural materials with high strength properties at near room and elevated temperatures and exhibit more isotropic behaviour under deformation than conventional Mg based alloys such as AZ31 (Mg-3Al-1Zn, wt%) alloy. However, little work has been devoted to hot working texture and microstructure of WE54 alloy and subsequent recrystallization. The present work was undertaken in order to clarify details of the microstructure and microtexture evolution of WE54 alloy upon hot deformation by uniaxial compression and annealing at 450°C during 7 days using electron back scattered diffraction (EBSD).

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ANTIPILLING EFFECT OF POLYMER AFFINITIES ON DIFFERENT FABRICS

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Ali Kara, Uludag University, Turkey

Abstract

Pilling is a fabric defect which is observed as small fibre balls or groups consisting of intervened fibres that have been attached to the fabric surface by one or more fibres. Pilling is an unwellcomed property in textile industry so it has became an attractive research area for many years. When synthetic fabrics such as polyester have been started to use more often, the importance of this topic have arised. However, this problem has not been still solved. For the purpose of decreasing the pilling of the fabrics, some useful methods were reported. Chemical finishing is one of the most useful method. In this method, polymers are applied by padding and coating techniques. However, they are not totally effective for all types of fabrics. Besides, in this method polyurethanes and enzymes are mostly used which cause some disadvantages. Firstly, polyurethanes that used for antipilling effect give tough handle because of their structure. Secondly, most products are expensive since they contain enzymes that have high cost as raw materials. In industry and also in literature there is no such product which does not have these disadvantages and usable for all types of fabrics. In this project, we aim to synthesize new functional polymers which give antipilling effect and soft handle to all types of fabrics without high cost. Additionally, they make fabrics more hydrophile or they do not lessen the hydrophilicity of fabrics. Most importantly, these functional polymers are stable and show antibacterial properties for a long time, they are soluble in water and finally they do not cause yellowing on fabrics.

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CARBON FIBER ENZYME ELECTRODES FABRICATED BY INVERTAZ AND POLYPHENOL OXIDASE ENZYMES

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Ayşe Elif Böyükbayram, Karabük University Department of Chemistry

Abstract

In this study, carbon fiber was used, as a new electrode material. Carbon fiber enzyme electrodes were prepared by immobilization of invertase and polyphenol oxidase enzymes on the electrodes of carbon fiber. The electrodes were obtained by immobilization of enzyme in the conductive polypyrrole polymer matrix during electrochemical polymerization of pyrrole onto laboratory–made carbon fiber electrodes. Kinetic parameters of immobilized enzyme, Vmax (Maximum reaction rate) and Km (substrate affinity) were determined. Vmax and Km values for invertase are 0.779 ± 0.120 umol/min.electrode and 27.20 ± 6.70 mM, for polyphenol oxidase 0.017 ± 0.004 umol/min.electrode and 176.00 ± 26.60 mM respectively. The influence of conditions on enzyme activity was investigated; optimum temperature and pH were found as 40 °C and pH 6.0 for immobilized invertase, 60 °C and pH 7.0 for immobilized polyphenol oxidase. Lineer working range is 0.0034 M - 0.0500 M and 0.035 M - 0.400 M for invertase and polyphenol oxidase respectively. Stability in consecutive measurements and shelf life were obtained. For invertase electrode, 70% activity was observed after 37 consecutive measurements, this was again 70% for poliphenol oxidase electrode after 20 consecutive measurements. In shelf life investigation, it was observed that 25% of activity was lost and 75% retained after 42 days for invertase electrode. For polyphenol oxidase electrode 40 days shelf life study was performed. It was seen that activity increased steadily and reached a high value at 40th day. Detection limit (LOD) and quantitation limit (LOQ) values are 0.0034 M and 0.01126 M for electrodes of immobilized invertase, 0.0353 M and 0.1170 M for electrodes of immobilized polyphenol oxidase. Study was completed by applying the enzyme electrodes to measurements of polyphenolic substances in real samples.

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Fabrication and characterization of pure and doped ZnO thin films

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Abstract

The present work consists on the fabrication and the characterization of pure and Sn, Sb, Al and Cu doped doped ZnO thin films and also on Al/Sb and Cu/Al codoped ZnO thin films in order to improve structural, optical and electrical properties of ZnO. Colloidal and Sol-gel methods were used and the films were deposited on glass, ITO and Si substrate by spin and dip-coating techniques. The characterization of Sn and Sb doped ZnO thin films shows that these materials are able to modify optical properties of ZnO films by increasing the band gap when we use Sb dopant and decreasing it when Sn dopant was used. Following this results, we have deposited Al doped and Sb codoped ZnO thin films on Si substrate in order to realize photovoltaique structures. Courant-voltage measurements revels that when the films are illuminated the current increases. Elecrical respense of (ZnO : Al) : Sb is modified by gaz H2 injection. So this film is suitable to be use in both photovoltaïque and gaz sensors. The characterization of Cu / Al codoped ZnO thin films showed that doping with Cu affects the structural properties of ZnO since it causes the increase of crystallite sizes gradually as the doping level increases. The introduction of Al also reduces the crystallites sizes and reduces the roughness of the layers. We also note that the refractive index decreases with the introduction of Al codopant while the extinction coefficient decreases substantially as the level of doping and codoping increases. This variation of the refractive index is probably related to the improvement of the crystallinity of the layers by Al codoping

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Highlight the reactivity of 52S4F, synthesised by fusion route, by solid state NMR

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Abstract

This work is devoted to the study of the reactivity of a quaternary glass: 52% SiO2, 30% CaO, 14% Na2O and 4% P2O5 (wt %) (named 52S4F) , synthesized by the fusion route. The physicochemical properties of 52S4F glasses were determined before and after immersion in simulated body fluid (SBF). The results obtained by various analysis methods, such as ICP, IR, SEM-EDS and solid state NMR, have shown that different structural modifications at the glass surface as a function of soaking time were occurred. The silica gel (SiO2) and the calcium phosphate layer (HA) were formed at the glass surfaces after the soaking in SBF. The crystallite size of HA layer is in the order of nano (as shown by SEM). NMR analysis highlights the different structural's alterations during soaking in SBF. It shows that, after 1 day soaking time, the silica gel is formed and it has grown until 15 days. In addition, it demonstrates that after 5 days the precipitation process becomes more dominant than the dissolution process of the glass, which confirms the results of the other used methods. Finally, according to the obtained results, the quaternary glass 52S4F is a bioactive glass.

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