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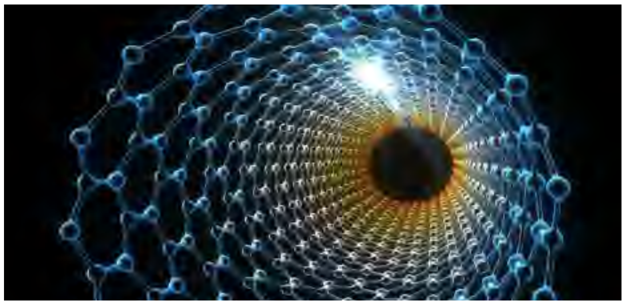
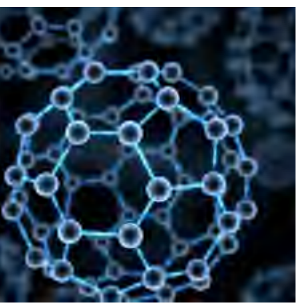
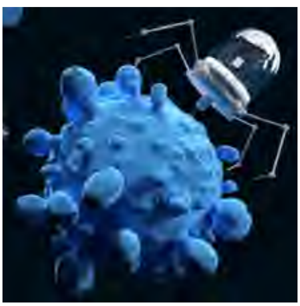
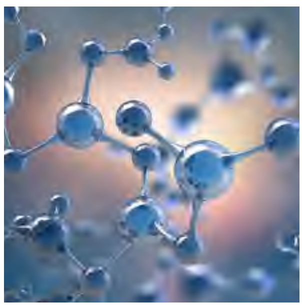
Nanoscience 2022

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Osman Adiguzel

Firat University, Turkey

Nanoscale aspects of shape reversibility and phase transformations in shape memory alloys

A series of alloy systems called shape memory alloys exhibit a peculiar property called the shape memory effect. This phenomenon is initiated on cooling and deformation and performed on heating, and performed on heating and cooling, with which shape of materials cycles between original and deformed shapes in a reversible way in the bulk level. Therefore, this behavior can be called thermal memory or thermoelasticity. These alloys exhibit another property, superelasticity, which is performed by stressing and releasing the material at a constant temperature at the parent phase region. Superelasticity exhibits ordinary elastic material behavior, but it is performed in a non-linear way; loading and unloading paths are different in the stress-strain diagram, and the hysteresis loop reveals energy dissipation Thermoelasticity is governed by the thermal and stress-induced martensitic transformations on cooling and stressing, and reverse austenitic transformation on heating. Superelasticity is governed by stress-induced martensitic and reverse austenitic transformations by stressing and releasing materials, with which ordered parent phase structures turn into detwinned martensitic structures and ordered parent phase structures, respectively. These transformations occur with the movements of atoms on an atomic scale at the sub-nano level. Thermal induced martensite occurs on cooling along with lattice twinning and ordered parent phase structures turn into twinned martensite structures by means of lattice invariant shears, and these structures turn into detwinned martensitic structures with deformation by means of stress-induced transformation. Lattice twinning occurs in two opposite directions, <110 > -type directions on the {110}-type plane of austenite matrix in a self-accommodating manner, by means of lattice invariant shear. Copper-based alloys exhibit this property in the metastable beta-phase region, which has bcc-based structures at a high-temperature parent phase field. Lattice invariant shear and lattice twinning are not uniform in these alloys and cause the formation of complex layered structures, depending on the stacking sequences on the close-packed planes of the ordered lattice. In the present contribution, x-ray and electron diffraction studies were carried out on two solution-treated copper-based CuZnAl and CuAlMn alloys. Electron and x-ray diffraction exhibit superlattice reflections. Specimens of these alloys were aged at room temperature, at which both alloys are in a martensitic state, and a series of x-ray diffractions were taken at different stages of aging in a long-term interval. X-ray diffraction profiles taken from the aged specimens in martensitic conditions reveal that crystal structures of alloys change in a diffusive manner.

Keywords: Shape memory effect, martensitic transformation, thermoelasticity, superelasticity, twinning, and detwinning

Recent Publications

1. Adiguzel O, et al (2021). Lattice Reactions Governing Thermoelasticity and Superelasticity in Shape Memory Alloys. Phys Sci & Biophys J 2021, 5(1): 000170
2. Adiguzel, O. (2020). Factors and Lattice Reactions Governing Phase Transformations in Beta Phase Alloys. In: Bonča, J., Kruchinin, S. (eds) Advanced Nanomaterials for Detection of CBRN, 101-109.
3. Adiguzel, O. (2020). Thermally and Stress Induced Phase Transformations and Reversibility in Shape Memory Alloys. In: Sidorenko, A., Hahn, H. (eds) Functional Nanostructures and Sensors for CBRN Defence and Environmental Safety and Security, 105-112.
4. Adiguzel, O. (2018). Thermoelasticity, Superelasticity and Nanoscale Aspects of Structural Transformations in Shape Memory Alloys. In: Struble, L., Tebaldi, G. (eds) Materials for Sustainable Infrastructure, 287–293.
5. Adiguzel, O. (2018). Thermoelastic Phase Transformations and Microstructural Characterization of Shape Memory Alloys. In: Bonča, J., Kruchinin, S. (eds) Nanostructured Materials for the Detection of CBRN, 99-106

Biography

Osman Adiguzel graduated from the Department of Physics, Ankara University, Turkey in 1974 and received Ph.D.- degree from Dicle University, Diyarbakir-Turkey. He studied at Surrey University, Guildford, UK, as a post-doctoral research scientist from 1986 to 1987, and studied shape memory alloys. He worked as a research assistant, from 1975 to 1980, at Dicle University and shifted to Firat University, Elazig, Turkey in 1980. He became a professor in 1996, and he has been retired on November 28, 2019, due to the age limit of 67, following academic life of 45 years. He published over 80 papers in international and national journals; He joined over 120 conferences and symposia at the international and national level as a participant, invited speaker, or keynote speaker with contributions of oral or poster. He served as the program chair or conference chair/co-chair in some of these activities. In particular, he joined last six years (2014 - 2019) over 60 conferences as Keynote Speaker and Conference Co-Chair organized by different companies. He supervised 5 Ph.D.- theses and 3 M. Sc- theses in his academic life. Also, he joined over 70 online conferences in the same way in the pandemic period of 2020-2021. Dr. Adiguzel served his directorate of the Graduate School of Natural and Applied Sciences, Firat University, from 1999-to 2004. He received a certificate awarded to him and his experimental group in recognition of the significant contribution of 2 patterns to the Powder Diffraction File – Release 2000. The ICDD (International Centre for Diffraction Data) also appreciates the cooperation of his group and interest in the Powder Diffraction File.

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Mohammed Al-Abri

Sultan Qaboos University, Oman

Nanotechnology advancements in emerging contaminants removal from wastewater

Higher living standards and the thriving pharmaceuticals industry, personal care products, micro and nano-plastics, and other human-made chemicals introduced a significant problem in the water system. Humanity struggles with the wastes generated from these activities. They find their way to natural water bodies causing water pollution. Conventional water treatment processes are inadequate to remove this waste. Therefore, they are called emerging or persistent contaminants. Additionally, unconventional wastewater sources are a cause of concern, such as the water produced from oil and gas fields, also known as produced water. Nanotechnology involves the manipulation of atoms and molecules of matter, which has contributed to significant advances across several different fields, including the treatment of wastewater. Several advanced studies have demonstrated the potential for nanotechnology, either directly or indirectly, or in combination with other technologies for persistent contaminants treatment.

Many nanotechnology-based water treatment processes have been developed to target persistent and emerging pollutants, ensuring complete removal with no secondary by-products. These processes include nano-adsorption, photocatalysis, and functionalized membranes. They target organic, inorganic, and biological contaminants offering high efficiency, modularity, low energy requirement, and low-cost solutions to wastewater treatment. Advanced wastewater treatment processes utilize nanomaterials due to their unique features. Nanotechnology introduces new properties, characteristics, and specialized functions highly desirable for wastewater treatment. It offers the modularity to synthesize different nanomaterials forms to treat different contaminant types. Highly functional nanomaterials provide innovative treatment processes capable of handling unconventional wastewater sources for water reuse.

Recently, nanomaterials synthesis has become increasingly environmentally friendly and more cost-effective. Nanomaterials possess desired properties for large-scale development and demonstrate high wastewater treatment potential. Organic, inorganic, and polymer-based nanomaterials are the main nanomaterials used in water remediation. The non-poisonous nature, small size, and high surface area of nanomaterials make them ideal for wastewater treatment. Nanotechnology has sought to overcome the drawback of conventional membranes by designing and fabricating hybrid or functionalized membranes. The recent development of advanced electrospun nanofiber polymeric membranes (ENMs) and nano-functionalized membranes has provided a new opportunity to improve membrane performance for non-conventional wastewater treatment dramatically.

The ENMs outclass other membrane types because of their large surface area, high porosity, and productivity. Due to the complexity of large-scale system design, translating nanotechnology-based water treatment strategies into industrial practice has been relatively slow. Moreover, in light of the maturity of basic science, it is long overdue, and it is critical to narrow the gap between research and industrial needs.

Recent Publications

1. Mohammed Al-Abri, et al (2021), Structural, Mössbauer, and Optical studies of mechano-synthesized Ru3+-doped LaFeO3 nanoparticles, RT Al-Mamari, HM Widatallah, ME Elzain, AM Gismelseed, AD Al-Rawas, et.al, Hyperfine Interactions 243 (1), 1-12
2. Mohammed Al-Abri, et al (2022) Ga-doped ZnO nanorods: The photocatalytic performance of methylene blue under solar irradiation, SSA Al Ghafry, MZ Al-Abri, B Al Farsi, F Al Marzouqi, LM Al Farsi, et.al, Optical Materials 126, 112139
3. Mohammed Al-Abri, et al(2022), Copper nanoparticles decorated N-doped mesoporous carbon with bimodal pores for selective gas

separation and energy storage applications, Ajay Karakoti, Ajayan Vinu, Mohammed Al-Abri, et.al, Chemical Engineering Journal 431, 134056

4. Mohammed Al-Abri, et al (2022) Degradation of Sulfamethoxazole by Double Cylindrical Dielectric Barrier Discharge System combined with Ti/CN-TiO2 supported Nanocatalyst, Mohammed Al-Abri, Andrei Sarbu, Mariana Braic, Viorel Braic, Sergey Dobretsov, Journal of Hazardous Materials Advances 5, 100051

5. Mohammed Al-Abri, et al (2022) Electric field enhanced in situ silica nanoparticles grafted activated carbon cloth electrodes for capacitive deionization, HH Kyaw, MTZ Myint, S Al-Harthi, H Ala'a, M Al-Abri, Separation and Purification Technology 281, 119888

Biography

Mohammed Zahir Al-Abri is an Associate Professor in Petroleum & Chemical Engineering, Department, College of Engineering at Sultan Qaboos University (SQU), Oman. In addition to his academic position, he is the Founder and Director of the Nanotechnology Research Center, SQU. He completed all his tertiary education at the University of Nottingham (UK) from 2003-to 2007. His major interest lies in cutting-edge research in water treatment, membrane technology, and environmental engineering including applications of nanotechnology in the water and petroleum industries. He has done more than 30 major research projects in different areas of water treatment and desalination, nanotechnology for environmental and renewable energy applications, and membrane technology. He has done more than 70 international journal papers, 27 international conferences, 25 technical reports, and three book chapters. He is a member of a number of international editorial boards including being a Topic Editor in “Membranes: MDPI Journal. He organized and co-organized several international conferences in nanotechnology and water treatment.

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Mohamed TAHIRI

University of Hassan II Casablanca, Morocco

Inkjet printing of silver conductive ink on textiles for wearable electronic applications

In this study, silver nanoparticles were synthesized with a starch-based reduction biosystem at room temperature. With this approach, high concentration silver nanoparticles were produced on a large scale with a low starch/AgNO3 mass ratio, which was very advantageous for the low cost and high conductivity. Conductive inks were prepared from the synthesized silver nanoparticles by dispersion of the nanoparticles in a non-conductive commercial ink. Various patterns have been developed by printing silver nanoparticles with different percentages from 5% to 25% on a cotton substrate using a syringe. The printed patterns show a resistivity drop depending on the sintering temperature and nanoparticle concentration in the range of 8M and 8× 10-5 MΩ by heat treatment varying between 60°C and 320°C for 10min. In addition, a LED test was successfully performed on the fabrics. These flexible patterns produced by inkjet printing would present a considerable success for textile-based electronic devices at a low cost.

Recent Publications

1. Mohamed TAHIRI (2020): Sulfate removal from aqueous solutions using esterified wool fibers: isotherms, kinetic and thermodynamic studies In Evertz, Janus, Linder (Hrsg.) 2020): Handbook of Pränatal and Perinatal Psychology. Basel: Springer International Publishing. S. 619-626
2. Fettouche, S.(2019), Boukhriss, A., Tahiri, M. et al. Naked Eye and Selective Detection of Copper(II) in Mixed Aqueous Media Using a Cellulose-based Support. Chem. Res. Chin. Univ. 35, 598–603 .
3. M. Tahiri, M. Laaouan, et al.(2017), Impact of stabilized leachate residues from the uncontrolled landfill of Mohammedia city on the ''Oued El Maleh'' river and on the soil. J. Mater. Environ. Sci., Volume 9, Issue 12, Page 4487-4495

Biography

Mohamed Tahiri is a Chairholder of UNCHAIN-UH2C (University Chair on Innovation) Since January 2010. As part of his TEMPUS-supported role, Mohamed TAHIRI has received extensive training in Europe in Innovation, Technology Transfer, Intellectual Property Rights, and innovation Management. He holds in his faculty a Bachelor's in sanitation management in urban areas. He's conducting R&D in partnerships with various industries. Professor Mohamed TAHIRI is awarded Hassan II Prize for Environment in 2009 for his contribution to disseminating citizen eco-initiatives at Moroccan university. He published over 40 general and research articles and organized international meetings and conferences in Morocco (FIERTE Maroc 2007: International Conference on Renewable Energies and Water Technologies in partnership with commerce and navigation chamber of Almeria Spain; MENA Symposium on ''Environment analysis and economical evaluation, Marrakech 2009).

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Bhupendra G. Prajapati

Ganpat University, India

Improving oral bioavailability via self nanoemulsifying approach

Exemestane HCl (EXM) is a novel irreversible steroidal aromatase inhibitor for the adjuvant treatment of hormonally responsive breast cancer in post-menopausal women. Poor aqueous solubility of EXM is the biggest hurdle for the development of solid oral dosage forms. That's why the aim of the current study is to formulate the self-nano emulsifying drug delivery (SNEDDs) system to improve the bioavailability of EXM. SNEDDs were formulated using the water titration method. Based on Solubility studies, components of SNEDDs viz., Caprol Microexpress and Labrafac as oil phase, Tween 80 as a surfactant, and Triacetin as a co-surfactant were selected. Phase studies were performed using different ratio surfactant:co-surfactant (1:1, 1:2, 1:3, 2:1, 3:1). Results suggested that Tween 80: triacetin (1:2) and (1:3) ratio with Caprol Microexpress and Labrafac alone were given the highest area of nanoemulsion. Based on that 10 different formulations were formulated and further optimization was done based on Visual assessment, optical clarity, particle size, drug content, and viscosity. Results revealed F3, F7, and F8 batches were showing the lowest size 7.313 ± 1.44 nm, 6.379 ± 0.45 nm, and 14.67 ± 0.37 nm respectively with less than 1 min for self-emulsification time. Among SNEDDS formulations F7 had 1.7-, 1.1- and 1.33-time higher AUC in comparison to EXM suspension, F3, and F8 batch. It was concluded that EXM SNEDDS improves pharmacokinetic parameters which subsequently improve oral bioavailability. SNEDDS is a novel and commercially feasible approach to improving oral bioavailability of BCS class-IV drug EXM and has the potential to improve oral bioavailability and improve stability.

Recent Publications

1. Paliwal, H., Parihar, A., & Prajapati, B. G. (2022). Current State-of-the-Art and New Trends in Self-Assembled Nanocarriers as Drug Delivery Systems. Front. Nanotechnol. 4: 836674. doi: 10.3389/fnano.
2. Prajapati, B., Paliwal, H., & Patel, J. (2022). Pharmacokinetics of Nanoparticle Systems for Pulmonary Delivery. In Pharmacokinetics and Pharmacodynamics of Nanoparticulate Drug Delivery Systems (pp. 347-364). Springer, Cham.
3. Paliwal, H. P., Prajapati, B. G., Khunt, D., Shirisha, C., Patel, J. K., & Pathak, Y. V. (2022). Pharmacokinetic and Tissue Distribution Study of Solid Lipid Nanoparticles. In Pharmacokinetics and Pharmacodynamics of Nanoparticulate Drug Delivery Systems (pp. 245-260). Springer, Cham.
4. Prajapati, B. G., Patel, H. P., & Patel, J. K. (2022). Nanoparticle Pharmacokinetic Profiling In Vivo Using Magnetic Resonance Imaging. In Pharmacokinetics and Pharmacodynamics of Nanoparticulate Drug Delivery Systems (pp. 399-416). Springer, Cham.

Biography

Bhupendra Prajapati works as a Professor in the Department of Pharmaceutics, Shree S.K.Patel College of Pharmaceutical Education and Research, Ganpat University, North Gujarat, India. He did his Ph.D. from Hemchandracharya North Gujarat University, Patan. He did his PG and UG from M.S.University, of Baroda. He has 19 years of experience in academic/industry (17+2). He has published more than 60 publications. the i10-index index is 33. He has been awarded by AICTE Young Teacher (2013), Distinguished Associate Professor in TechNExt India 2017 by CSI, Mumbai, and President award of Staff Excellence in Research (2019) and Capacity Building (2020) by Ganpat University for the consecutive year 2021 and 2022 respectively. His two patents were published and Three applications were submitted to the Indian Patent Office in the field of NDDS.

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Norie Allafi Akeel

Sohar University, Oman

Analysis of Mechanical Properties of Epoxy and Silk Composite Materials

This study looks into new natural fiber reinforced composite material. The fibers are made from natural recycled materials which have some advantages over synthetic reinforcement; including lower cost, equivalent strength, lower density, and degradability. Compression Molding techniques with a pressure of 140 pa and a temperature of 60oC were used to create the composite material samples with various fiber weight ratios. The current investigations involve the fabrication of fiber-reinforced epoxy composite materials and the evaluation of their mechanical properties. Mechanical tests such as tensile testing, impact loading, flexural strength, and hardness were performed on all samples. The maximum tensile strength achieved is 45 MPa, elastic modulus of 1580 MPa, and hardness value is 21.5 Hv. The new composite materials with natural reinforcement are stronger compared to the material without fiber. The reason is due to the combination of fiber and epoxy material.

Keywords: Tensile strength, silk materials, fiber-reinforced epoxy, thermal, hardness, and composite materials.

Recent Publications

1. Akeel, N.A., Kumar, V.V., Raut, N., et al.(2022), Experimental investigation of cooling potential of a ventilated cool roof with an air gap as a thermal barrier. Environ Dev Sustain .
2. N Akeel., VV Kumar, N Raut,et al.(2021), An experimental investigation on passive and hybrid roof cooling systems with a double skin envelope,, Energy Sources, Part A: Recovery, Utilization, and Environmental Effects, 1-13
3. N Akeel., VV Kumar, N Raut,et al.(2021), Double skin polystyrene-aluminium radiation reflector roofs in arid environments for passive cooling-A case study in Sohar, Sultanate of Oman, Case Studies in Thermal Engineering 28, 101655
4. NA Akeel, V Kumar, OS Zaroog,et al.(2021), Investigation of Mechanical Properties of Silk and Epoxy Composite Materials, Key Engineering Materials 889, 27-31
5. OSZ Norie A. Akeel, Vinod Kumar,et al.(2021), Impact of the Heat Treatment Process on the Properties of Stainless Steel Material, Solid State Technology 64 (2), 1461 - 1471

Biography

Norie Allafi Akeel currently works at the Faculty of Engineering, Sohar University. Norie does research in Composite Materials, Failure Analysis, and using Ansys, SolidWorks for FEA. Their current project is (Fatigue Analysis and Composite Materials). His research interest is Mechanical Engineering, Materials Engineering, Finite Element Modeling, Stress Analysis, Finite Element Analysis, Fracture Mechanics, Computational Mechanics, Solid Mechanics, and Simulation Corrosion.

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Brunello Tirozzi

The University of Rome, Italy

Scattering of em waves in a magnetized plasma

This study looks into new natural fiber reinforced composite material. The fibers are made from natural recycled materials which have some advantages over synthetic reinforcement; including lower cost, equivalent strength, lower density, and degradability. Compression Molding techniques with a pressure of 140 pa and a temperature of 60oC were used to create the composite material samples with various fiber weight ratios. The current investigations involve the fabrication of fiber-reinforced epoxy composite materials and the evaluation of their mechanical properties. Mechanical tests such as tensile testing, impact loading, flexural strength, and hardness were performed on all samples. The maximum tensile strength achieved is 45 MPa, elastic modulus of 1580 MPa, and hardness value is 21.5 Hv. The new composite materials with natural reinforcement are stronger compared to the material without fiber. The reason is due to the combination of fiber and epoxy material.

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Biography

Norie Allafi Akeel currently works at the Faculty of Engineering, Sohar University. Norie does research in Composite Materials, Failure Analysis, and using Ansys, SolidWorks for FEA. Their current project is (Fatigue Analysis and Composite Materials). His research interest is Mechanical Engineering, Materials Engineering, Finite Element Modeling, Stress Analysis, Finite Element Analysis, Fracture Mechanics, Computational Mechanics, Solid Mechanics, and Simulation Corrosion.

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