

Nektaria-Marianthi Barkoula, PhD

Position: Professor of “Durability of Composite Materials Under Thermo-mechanical and Environmental Loadings”
Tel: +30 2651008003
Location: Department of Materials Science and Eng.
University of Ioannina, Greece
Email: nbarkoul@uoi.gr; nbarkoula@gmail.com
Research keywords: Biodegradable/Biobased Composites, Nanocomposites, Eco-friendly Materials, Concrete based Materials, Durability, Wear, Structure-property relationships

Education

Ph.D. Materials Science and Engineering **03/1999- 02/2002**

University of Kaiserslautern, Germany, Department of Mechanical and Chemical Engineering

Dissertation: "Solid Particle Erosion of Polymers and Polymeric Composites" [IVW-Schriftreihe Band 29, Neitzel, M.(ed.), IVW Kaiserslautern 2002.]

Supervisor: Prof. Dr.-Ing. József Karger-Kocsis (IVW Ltd.)

Diploma of Mechanical Engineering **09/1993- 09/1998**

University of Patras, Greece, Department of Mechanical and Aeronautical Engineering

Major: Applied Mechanics, Composite Materials

Final Year Thesis: "Hygrothermal behaviour of fibre and particulate composite materials “.

Professional Experience

Professor	09/2020 - today
Associate Professor	09/2016 - 09/2020
Assistant Professor	07/2012 - 09/2016
Lecturer	09/2007 - 06/2012

University of Ioannina, Greece, Department of Materials Science & Engineering

Research Domain:

mechanics and durability of composite materials (wear behavior, mechanical/thermomechanical characterization, environmental loading, fracture, and fatigue)

biodegradable antimicrobial micro/nanocomposites: manufacturing, processing, and characterization (targeting at food packaging / bioengineering applications)

Member of the Composite and Smart Materials Laboratory (CSML)

<http://csmlab.materials.uoi.gr/index.php/en/>

Affiliated member of the Laboratory of Mechanics, Smart Sensors and Nondestructive Evaluation (MSS-NDE) <http://mss-nde.uoi.gr/>

Project Manager and Process Engineer 03/2005 – 08/2007

Procter & Gamble, Belgium, Brussels Innovation Centre

Role: Developing, designing, constructing and start-up manufacturing processes and new engineering technologies for P&G's world-class consumer products, Managing the company's multi-million dollar capital Investments program and having clear accountability to the bottom line business results, Coordination of multi-functional, multi-nationality teams

Lecturer (Fixed Term) 03/2004 – 02/2005

University of Patras, Greece, Materials Department

Research Domain: Composite Materials, Mechanical and thermomechanical properties

Research Associate 03/1999 – 03/2004

QMUL, UK, Materials Department, 18 months

Research Domain: Self-reinforced polymer composites, natural fibre composites, Eco-friendly composites

Institute for Composite Materials (IVW GmbH), Kaiserslautern, Germany, Materials Science Division, 40 months

Research Domain: Tribological behaviour of polymers and polymer composites

Research**Research Interests****Structure-property relationships in materials**

- Durability of polymers/ polymer composites and cement-based composites and their relation to physical, structural, and mechanical properties
- Experimental research around tribological behaviour of polymers, metals, and composites with focus on solid particle erosion

Biodegradable/bioactive polymers - composites

- Manufacturing, processing, and characterization of biodegradable/biobased composites using matrices such as Chitosan and Starch reinforced with clays. Special interest in food packaging application properties, such as mechanical, thermomechanical properties, permeability, antimicrobial properties, and water sorption

Nanocomposites / Multi-functional materials / Hierarchical composites

- Nanomodified polymer- and cement-based materials for enhanced mechanical behaviour, fracture toughness, structural integrity monitoring, damage detection possibilities, thermoelectric energy management etc
- Thermoset matrix composites with dynamic reversible bonds and healing, reforming and recycling capabilities

Bioengineering / Biomaterials

- Study of the biomechanical response of the Anterior Cruciate Ligament using destructive and non-destructive methods
- Study of the thermomechanical response of Chitosan/Alginate scaffolds
- Manufacturing of Chitosan based mats for wound dressing applications - Integration / Encapsulation of bio-active compounds in polymers/ polymer matrix composites: Special interest in bio-medical applications

Supervision of post graduate students

Supervision of 4 PhD and 5 MSc students

PhD Thesis

- Dispersion and durability response of nanocomposites for construction applications, Panagiota Alafogianni, Finished in 2019.
- Advanced cementitious composites for thermoelectric energy harvesting, Ioanna Vareli, Started in Nov 2019.
- Methodologies of monitoring the properties of hierarchical cementitious composite materials with advanced functionalities, Katerina Gkaravela, Started in April 2020.
- Development and characterization of advanced composite materials with life extension, re-usability and/or recycling capabilities, Evanthia Tzouma, Started in July 2020.

MSc Thesis

- Innovative biodegradable hybrid materials based on Chitosan and clays - A durability study, Kalouda Grigoriadi, Finished in 2013.
- Effect of plasticizers type and content on the morphological, mechanical, thermomechanical, and antimicrobial properties of Chitosan based clay nanocomposites, Maria Vlachou, Finished in 2015.
- Characterization of Recycled Aggregates after demolition of buildings and their effect on the compressive strength of concrete, Marilena Georgosopoulou, Finished in 2015.
- Effect of TiO₂ addition on the thermomechanical, dielectric and photocatalytic properties of electroactive polymers, Dimitrios Vaimakis, Finished in 2017.
- Effect of ZnO addition on the morphological, thermo-mechanical, barrier and antimicrobial properties of chitosan-based films for food packaging applications, Olga Boura-Theodoridou, Finished in 2017
- Development and characterization of PS-based nanocomposites, Zoi Siasou, Finished in 2018

Research Projects

Nektaria Barkoula' recent work on nanocomposites has been supported from competitive National/EU grants

Principal Investigator

- "Effect of nanoreinforcement and dispersion agents on the transport properties and chloride penetration of cement mortars prior and post environmental degradation", Project No. (MIS) 55005794, Operational Program "Human Resources Development, Education and Lifelong

Learning" (May 2018 – Sept 2019). Funding: European Union (European Social Fund) and Greek national funds.

- “Advanced composites for power generation in order to supply low energy requirement electronic circuits by photo-thermal energy harvesting”, Project No. (MIS) 5047641, Operational Program "Human Resources Development, Education and Lifelong Learning" (Feb 2020 – May 2021). Funding: European Union (European Social Fund) and Greek national funds.

Participating in the grant preparation / member of the scientific team

- “Nano-modified Smart Concrete”, Project No. 11ΣΥΝ_5_1430, “Cooperation 2011, Partnerships of Production and Research Institutions in Focused Research and Technology Sectors” (October 2013 – June 2015). Responsible on behalf of University of Ioannina: Professor T. Matikas, Funding: EU and Greek General secretariat for research and technology
- “Study of Damage of Plastic Panels Due to Environmental Exposure”, Responsible on behalf of University of Ioannina: Professor T. Matikas, Funding: Greek Secretariat for Research & Technology, under the program “Innovation Coupons for SMEs” (2011)

Participating in the research team of following projects:

- “Hierarchical multi-functional cement composite materials with optimal structural properties, inherent health monitoring and thermoelectric energy generation for smart & safe structures (HICOTEG)”, PI: Professor A. Paipetis, Funding: Greek Secretariat for Research & Technology, (2019-2022)
- “Hierarchical multifunctional composites with thermoelectrically powered autonomous structural health monitoring for the aviation industry (HARVEST)”, PI: Professor A. Paipetis, Funding: EU under the Horizon 2020 program, (2018-2021)
- “Development of innovative cosmetic products and nutritional supplements by nano-encapsulation of natural bioactive ingredients”, PI: Professor H. Stamatis, Funding: Greek Secretariat for Research & Technology, (2018-2021)
- “Optimum Operation and Maintenance of Road Network Bridges” Responsible on behalf of University of Ioannina: Professor T. Matikas, Funding: EU and Epirus Region under the program “New Knowledge” (2011-2015)
- “Development of composite materials and structural integrity monitoring methodologies – assessing the potential of self-healing”, Responsible on behalf of University of Ioannina: Professor A. Paipetis, Funding: Greek Secretariat for Research & Technology, under the program “THALES” (2011-2015)
- “Self-healing polymers for concepts on self-repaired aeronautical composites (IPOCRATES)”, PI: Professor A. Paipetis, Funding: EU under the FP7 program (2013-2016)
- “Innovative Repair of Aerospace Structures with Curing Optimization and Life Cycle Monitoring Abilities (IAPETUS)”, Project No. ACP8-GA-2009-234333 (June 2009 – May 2012). Responsible on behalf of University of Ioannina: Associate Professor A. Paipetis, Funding: EU

- “Polymeric construction materials with Ultimate properties, Recyclability and Environmental safety (PURE)”, Project No. EETK97104 (January 1999- December 2003). Responsible on behalf of Queen Mary University of London: Prof. Dr. Ton Peijs, Funding: Dutch Government
- “Stiffened polypropylene vacuum formings for orthoses to improve patients’ comfort and mobility (ORTHOFLEX)”. Project No. CRAF-1999-70851 (April 2002- March 2004). Responsible on behalf of Queen Mary University of London: Prof. Dr. Ton Peijs, Funding: EU
- “Development of polymer composites with natural fibres and their application”. Great Britain – Hungary Bilateral Project (‘GB-44/01’, Jan 2003– Dec2004)”. Supervisors: Prof. Dr Ton Peijs (Materials Department, Queen Mary University of London), Dr. Tibor Czigány (Faculty of Mechanical Engineering, Department of Polymer Engineering, Budapest University of Technology and Economics).
- “Erosionsverschleiß von Faseverbundwerkstoffen und Werkstoffverbunden” (Solid particle erosion of polymers and polymeric composites). Project No. KA 1202/6-1 and KA 1202/6-3 (March 1999- Feb 2002). Supervisor: Prof. Dr.-Ing. József Karger-Kocsis (IVW Ltd.). Funding: German Science Foundation
- “Raman Spectroscopic Study on the Strain-Induced Phase Transformation in isotactic and syndiotactic Polypropylenes”. Germany – Greece Bilateral Project (‘GRI-023-99’, September 1999 - August 2001). Supervisors: Prof. Dr.-Ing. József Karger-Kocsis (IVW Ltd.), Prof. Dr. Constantine Galiotis (ICEHT (FORTH), Patras, GR).
- “Long Term Properties of Short-Fibre Composites” (05.2002-07.2002). Supervisors: Prof. Dr.-Ing. Dr. h. c. Klaus Friedrich (IVW Ltd.), Prof. Dr. Zhong Zhang (IVW Ltd.). Funding: Alexander von Humboldt Foundation (KOSMOS)

Reviewing activities

- Reviewer in the several Scientific Journals (indicative): ACS Sustainable Chemistry & Engineering, Advanced Composite Letters, ASME Journal of Tribology, Carbohydrate Polymers, Ceramics, Composites Science and Technology, Composites: Part A, Composites: Part B, Construction and Building Materials, Crystals, Developments in the Built Environment, Express Polymer Letters, Industrial Crops and Products, International Journal of Biological Macromolecules, International Journal of Materials and Product Technology, International Journal of Renewable Energy Technology, International Journal of Solids and Structures, Journal of Applied Polymer Science, Journal of Composites Science, Journal of Materials Science, Journal of Materials Science: Materials in Electronics, Journal of Reinforced Plastics and Composites, Journal of Thermoplastic Composite Materials, KMUTNB International Journal of Applied Science and Technology, Materials (MDPI), Materials Chemistry and Physics, Materials Science & Engineering C – biomimetic and supramolecular systems, Molecules, Nanomaterials, Polymer Bulletin, Polymer Engineering and Science, Polymers (MDPI), Wear

Publications / Bibliometrics

Google Scholar: <https://scholar.google.gr/citations?user=RTdZqi0AAAAJ&hl=en>

- 70 research papers in international peer reviewed journals
- 4 chapter in handbook (international edition)
- 33 research papers in international peer reviewed conference proceedings
- 44 abstracts in conference proceedings of national and international conferences
- 3080 citations of published papers (excluding self citations of selected author Scopus, Nov 2020, h index=30)

Teaching and other activities

Teaching

Modules in undergraduate and postgraduate materials science and engineering programs:

- Materials Science
- Composite Materials
- Mechanical Behaviour of Composite Materials (lab course)
- Durability of Materials
- Environmental Properties of Materials
- Advanced Structure-Property Relationships
- Advanced Materials Characterization Techniques
- Research Methods and Experimental Techniques in Engineering

Other activities

- Expert Evaluator in National and International Research Projects (e.g. EU Horizon 2020, Twinning programme, DT-NMBP programme)
- Invited speaker, Session Chairman in National and International Conferences
- Member: Technical Chamber of Greece, European Society for Composite Materials (ESCM)
- Hellenic Society for Thermal Analysis, Vice-President
- Hellenic Society for Biomaterials, Member of the board (replacement)

Publication list

PhD Thesis

2002

Barkoula, N. M.: Solid particle erosion behaviour of polymers and polymeric composites. IVW-Schriftreihe Band 29, Neitzel, M., (ed), IVW Kaiserslautern 2002.

International Peer Reviewed Journals

2001

- J1. **Barkoula, N. M.,** Gremmels, J., Karger-Kocsis, J.: Dependence of solid particle erosion on the cross-linked density in an epoxy resin modified by hygrothermally decomposed polyurethane. *Wear* 247 (2001), pp. 100-108.

- J2. Moos, E., **Barkoula, N. M.**, Karger-Kocsis, J.: Strahlerosionsverhalten von Polymeren und Polymeren Verbundwerkstoffen. *Kunststoffe Plast Europe* 4 (2001), pp. 113-115 (In German) and Determining wear mechanisms. *Kunststoffe Plast Europe* 91(4) (2001), pp.43-44 (In English).
- 2002**
- J3. **Barkoula, N. M.**, Karger-Kocsis, J.: Solid particle erosion of unidirectional GF reinforced EP composites with different fiber/matrix adhesion. *Journal of Reinforced Plastics and Composites* 21(15) (2002), pp. 1377-1388.
- J4. **Barkoula, N. M.**, Papanicolaou, G. C., Karger-Kocsis, J.: Prediction of the residual tensile strength after solid particle erosion of CF/EP composite laminates with and without interleaves. *Composites Science and Technology* 62(1) (2002), pp. 121-130.
- J5. **Barkoula, N. M.**, Karger-Kocsis J.: Effects of fibre content and relative fibre orientation on the solid particle erosion of GF/PP composites. *Wear* 252 (2002), pp. 80-87.
- J6. **Barkoula, N. M.**, Karger-Kocsis, J., Papanicolaou, G. C.: Prediction of the residual tensile strength after solid particle erosion of UD-GF/PP composites. *Journal of Composite Materials* 36(14) (2002), pp. 1745-1756.
- J7. **Barkoula, N. M.**, Karger-Kocsis, J.: Processes and influencing parameters of the solid particle erosion of polymers and their composites. A review. *Journal of Materials Science* 37(18) (2002), pp. 3807-3820.
- 2003**
- J8. Aprem, A.S., Jose, S., Thomas, S., **Barkoula, N. M.**, Karger-Kocsis, J.: Influence of hygrothermally degraded polyester-urethane on physical and mechanical properties of chloroprene rubber. *European Polymer Journal* 39 (2003), pp. 69-76.
- J9. Aprem, A.S., Thomas, S., Joseph, K., **Barkoula, N. M.**, Karger-Kocsis, J.: Sulphur vulcanisation of Styrene-butadiene rubber using a new binary accelerator system. *Journal of Elastomers and Plastics* 35 (2003), pp. 29-55.
- J10. Aprem, A.S., Joseph, K., Thomas, S., **Barkoula, N. M.**, Karger-Kocsis, J.: Effect of 1-phenyl-2,4-dithiobiuret as secondary accelerator on cure characteristics and vulcanisate properties of natural rubber-styrene/butadiene rubber blends. *Plastics, Rubber and Composites* 32 (2003), pp. 3-10.
- J11. Zhang, Z., **Barkoula, N. M.**, Karger-Kocsis, J., Friedrich, K.: Artificial neural network predictions on erosive wear of polymers. *Wear* 255 (2003), pp. 708-713.
- 2005**
- J12. **Barkoula, N. M.**, Schimanski, T., Loos, J., Peijs, T.: Processing of single polymer composites using the concept of constrained fibres. *Polymer Composites* 26(1) (2005), pp. 114-120.
- 2006**
- J13. Alcock, B., Cabrera, N. O., **Barkoula, N. M.**, Loos, J., Peijs, T.: The mechanical properties of unidirectional all-polypropylene composites. *Composites Part A: Applied Science and Manufacturing* 37(5) (2006), pp. 716-726.
- J14. Alcock, B., Cabrera, N. O., **Barkoula, N. M.**, Peijs, T.: Low velocity impact performance of recyclable all-polypropylene composites, *Composites Science and Technology* 66(11-12) (2006), pp. 1724-1737.
- 2007**
- J15. Alcock, B., Cabrera, N. O., **Barkoula, N. M.**, Spoelstra, A.B., Loos, J., Peijs, T.: The mechanical properties of woven tape all-polypropylene composites. *Composites Part A: Applied Science and Manufacturing* 38 (2007), pp. 147-161.
- J16. Alcock, B., **Barkoula, N. M.**, Loos, J., Peijs, T.: Interfacial properties of highly oriented co-extruded polypropylene tapes for the creation of recyclable all-

- polypropylene composites, *Journal of Applied Polymer Science* 104(1) (2007), pp. 118-129.
- J17. Alcock, B., Cabrera, N. O., **Barkoula, N. M.**, Reynolds, C.T., Govaert, L.E., Peijs, T.: The effect of temperature and strain rate on the mechanical properties of highly oriented polypropylene tapes and all-polypropylene composites. *Composites Science and Technology* 67(10) (2007), pp. 2061-2070.
- 2008**
- J18. Alcock, B., Cabrera, N. O., **Barkoula, N.-M.**, Wang, Z., Peijs, T.: The effect of temperature and strain rate on the impact performance of all-polypropylene composites. *Composites Part B: Engineering* 39 (2008), pp. 537-547.
- J19. **Barkoula, N. M.**, Alcock, B., Peijs, T.: Fatigue properties of highly oriented polypropylene tapes and all-polypropylene composites. *Polymers and Polymer Composites* 16(2) (2008), pp. 101-113.
- 2009**
- J20. **Barkoula, N. M.**, Paipetis, A., Matikas, T., Vavouliotis, A., Karapappas, P., Kostopoulos, V.: Environmental degradation of carbon nanotube modified carbon fibre reinforced laminates: an electrical resistivity study. *Mechanics of Composite Materials* 45(1) (2009), pp. 21-32.
- J21. Alcock, B., Cabrera, N. O., **Barkoula, N. M.**, Peijs, T.: Direct forming of all-Polypropylene composites products from fabrics made of co-extruded tapes. *Applied Composite Materials* 16(2) (2009), pp. 117-134.
- J22. Alcock, B., Cabrera, N. O., **Barkoula, N. M.**, Peijs, T.: The effect of Processing Conditions on the mechanical properties and thermal stability of highly oriented PP Tapes. *European Polymer Journal* 45(10) (2009), pp. 2878-2894.
- J23. Soulioti, D., **Barkoula, N. M.**, Paipetis, A., Matikas, T., Shiotani, T., Aggelis, D. G.: Acoustic emission behaviour of steel fiber reinforced concrete under bending. *Constructions and Building Materials*, 23(12) (2009), pp 3532-3536.
- J24. Myriounis, D. P., Hasan, S. T., **Barkoula, N. M.**, Paipetis, A., Matikas, T.: Effects of heat treatment on microstructure and the fracture toughness of SiCp/Al alloy metal matrix composites. *Journal of Advanced Materials* 41(3) (2009), pp. 18-27.
- 2010**
- J25. Patnaik, A., Satapathy, A., Chand, N., **Barkoula, N. M.**, Biswas, S.: Solid particle erosion wear characteristics of fiber and particulate filled polymer composites: a review. *Wear* 268 (1) (2010), pp. 249-263.
- J26. **Barkoula, N. M.**, Garkhail, S. K., Peijs, T.: Biodegradable composites based on flax/poly-hydroxy-butyrate and its copolymer with hydroxyvalerate. *Industrial Crops and Products* 31 (1) (2010), pp. 34-42.
- J27. **Barkoula, N. M.**, Garkhail, S. K., Peijs, T.: Effect of compounding and injection moulding on the mechanical properties of flax fibre polypropylene composites. *Journal of Reinforced Plastics and Composites* 29 (9) (2010), pp. 1366-1385.
- J28. Deng, H., Reynolds, C. T., Cabrera, N. O., **Barkoula, N. M.**, Alcock, B., Peijs, T.: The water absorption behaviour of all-polypropylene composites and its effect on mechanical properties. *Composites Part B: Engineering* 41 (4) (2010), pp. 268-275.
- J29. Paschos, N. K., Gartzonikas, D., **Barkoula, N. M.**, Moraiti, C., Paipetis, A., Matikas, T. E., Georgoulis, A. D.: Cadaveric study of anterior cruciate ligament failure patterns under uniaxial tension along the ligament. *Journal of Arthroscopic and Related Surgery* 26(7) (2010), pp. 957-967.
- J30. Aggelis, D., **Barkoula, N. M.**, Matikas, T. E., Paipetis, A.: Acoustic emission monitoring of degradation of cross ply laminates. *Journal of the Acoustical Society of America* 127 (6) (2010), pp. EL246-EL251.
- 2011**

- J31. Soulioti, D., **Barkoula, N. M.**, Paipetis, A., Matikas, T. E.: Effects of fiber geometry and volume fraction on the flexural behavior of steel-fiber reinforced concrete. *Strain* 47 (2011), pp e535–e541.
- J32. Aggelis, D. G., Paschos, N. K., **Barkoula, N. M.**, Paipetis, A., Matikas, T. E., Georgoulis, A. D.: Rupture of anterior cruciate ligament monitored by acoustic emission. *Journal of the Acoustical Society of America* 129(6) (2011), pp. EL217-EL222.
- J33. Grammatikos, S., Kordatos, E., **Barkoula, N.**, Matikas, T., Paipetis, A.: Innovative non-destructive evaluation and damage characterisation of composite aerostructures using thermography. *Plastics, Rubber and Composites* 40(6/7) (2011), pp. 342-348.
- J34. Aggelis, D. G., Soulioti, D. V., Sapouridis N., **Barkoula, N. M.**, Paipetis, A., Matikas, T. E.: Acoustic emission characterization of the fracture process in fibre reinforced concrete. *Construction and Building Materials* 25(11) (2011), pp. 4126-4131.
- 2012**
- J35. Gkikas, G., **Barkoula, N.-M.**, Paipetis, A.S. Effect of dispersion conditions on the thermo-mechanical and toughness properties of multi walled carbon nanotubes-reinforced epoxy. *Composites Part B: Engineering*, 43 (6) (2012), pp. 2697-2705.
- J36. Gkikas, G., Sioulas, D., Lekatou, A., **Barkoula, N.M.**, Paipetis, A.S. Enhanced bonded aircraft repair using nano-modified adhesives. *Materials and Design*, 41 (2012), pp. 394-402.
- J37. Aggelis, D.G., **Barkoula, N.-M.**, Matikas, T.E., Paipetis, A.S. Acoustic structural health monitoring of composite materials : Damage identification and evaluation in cross ply laminates using acoustic emission and ultrasonics. *Composites Science and Technology*, 72 (10) (2012), pp. 1127-1133.
- J38. Aggelis, D.G., Soulioti, D.V., **Barkoula, N.M.**, Paipetis, A.S., Matikas, T.E. Influence of fiber chemical coating on the acoustic emission behavior of steel fiber reinforced concrete. *Cement and Concrete Composites*, 34 (1) (2012), pp. 62-67.
- 2013**
- J39. Triantafyllidi, E., Paschos, N.K., Goussia, A., **Barkoula, N.-M.**, Exarchos, D.A., Matikas, T.E., Malamou-Mitsi, V., Georgoulis, A.D. The shape and the thickness of the anterior cruciate ligament along its length in relation to the posterior cruciate ligament: A cadaveric study. *Arthroscopy - Journal of Arthroscopic and Related Surgery*, 29 (12) (2013), pp. 1963-1973.
- J40. Aggelis, D.G., **Barkoula, N.-M.**, Matikas, T.E., Paipetis, A.S. Acoustic emission as a tool for damage identification and characterization in glass reinforced cross ply laminates. *Applied Composite Materials* (2013), 20 (4), pp. 489-503.
- J41. Paschos, N.K., Aggelis, D.G., **Barkoula, N.-M.**, Paipetis, A., Gartzonikas, D., Matikas, T.E., Georgoulis, A.D. An Acoustic Emission Study for Monitoring Anterior Cruciate Ligament Failure Under Tension. *Experimental Mechanics*, 53 (5) (2013), pp. 767-774.
- J42. Gkikas, G., Paipetis, A., Lekatou, A., **Barkoula, N.M.**, Sioulas, D., Canflanca, B., Florez, S. Corrosion and environmental degradation of bonded composite repair. *International Journal of Structural Integrity*, 4 (1) (2013), pp. 67-77.
- J43. Grigoriadi, K., Giannakas, A., Ladavos, A., **Barkoula, N.-M.** Thermomechanical behavior of polymer/layered silicate clay nanocomposites based on unmodified low density polyethylene. *Polymer Engineering and Science*, 53 (2) (2013), pp. 301-308.
- J44. Soulioti, D.V., **Barkoula, N.-M.**, Koutsianopoulos, F., Charalambakis, N., Matikas, T.E. The effect of fibre chemical treatment on the steel fibre/cementitious matrix interface. *Construction and Building Materials*, 40 (2013), pp. 77-83.

- J45. Aggelis, D.G., Soulioti, D.V., Gatselou, E.A., **Barkoula, N.-M.**, Matikas, T.E. Monitoring of the mechanical behavior of concrete with chemically treated steel fibers by acoustic emission. *Construction and Building Materials*, 48 (2013), pp. 1255-1260.

2014

- J46. Giannakas, A., Grigoriadi, K., Leontiou, A., **Barkoula, N.-M.**, Ladavos, A. Preparation, characterization, mechanical and barrier properties investigation of chitosan-clay nanocomposites. *Carbohydrate Polymers*, 108 (1) (2014), pp. 103-111.
- J47. Katerinopoulou, K., Giannakas, A., Grigoriadi, K., **Barkoula, N.M.**, Ladavos, A. Preparation and characterization of acetylated corn starch-(PVOH)/clay nanocomposite films. *Carbohydrate Polymers*, 102 (1) (2014), pp. 216-222.

2015

- J48. Dassios, K. G., Alafogianni, P., Antiohos, S. K., Leptokaridis, C., **Barkoula, N.-M.**, Matikas, T. E. Optimization of Sonication Parameters for Homogeneous Surfactant-Assisted Dispersion of Multiwalled Carbon Nanotubes in Aqueous Solutions. *The Journal of Physical Chemistry C* 119 (13) (2015), pp. 7506-7516.
- J49. Gkikas, G., Douka, D.-D., **Barkoula, N.-M.**, Paipetis, A.S. Nano-enhanced composite materials under thermal shock and environmental degradation: A durability study. *Composites Part B: Engineering*, 70 (2015), pp. 206-214.
- J50. Grigoriadi, K., Giannakas, A., Ladavos, A.K., **Barkoula, N.-M.** Interplay between processing and performance in chitosan-based clay nanocomposite films. *Polymer Bulletin*, 72 (5) (2015), pp. 1145-1161.
- J51. Tsoumani, A.A., Barkoula, N.-M., Matikas, T.E. Recycled aggregate as structural material. *Waste and Biomass Valorization*, 6 (5) (2015), pp. 883-890.

2016

- J52. Giannakas, A., Vlachas, M., Salmas, C., Leontiou, A., Katapodis, P., Stamatis, H., **Barkoula, N.-M.**, Ladavos, A. Preparation, characterization, mechanical, barrier and antimicrobial properties of chitosan/PVOH/clay nanocomposites. *Carbohydrate Polymers*, 140 (2016), pp. 408-415.
- J53. Vlachas, M., Giannakas, A., Katapodis, P., Stamatis, H., Ladavos, A., **Barkoula, N.-M.** On the efficiency of oleic acid as plasticizer of chitosan/clay nanocomposites and its role on thermo-mechanical, barrier and antimicrobial properties - Comparison with glycerol. *Food Hydrocolloids*, 57 (2016), pp. 10-19.
- J54. Alafogianni, P., Dassios, K., Farmaki, S., Antiohos, S.K., Matikas, T.E., **Barkoula, N.-M.** On the efficiency of UV-vis spectroscopy in assessing the dispersion quality in sonicated aqueous suspensions of carbon nanotubes. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 118 (2016), pp. 118-124.
- J55. Papadopoulos, A., Gkikas, G., Paipetis, A. S., **Barkoula, N.-M.**: Effect of CNTs addition on the erosive wear response of epoxy resin and carbon fibre composites. *Composites Part A: Applied Science and Manufacturing*, 84 (2016), pp. 299-307.
- J56. **Barkoula, N.-M.**, Ioannou, C., Aggelis, D.G., Matikas, T.E. Optimization of nano-silica's addition in cement mortars and assessment of the failure process using acoustic emission monitoring. *Construction and Building Materials*, 125 (2016), pp. 546-552.
- J57. Kenanakis, G., Vasilopoulos, K.C., Viskadourakis, Z., **Barkoula, N.-M.**, Anastasiadis, S.H., Kafesaki, M., Economou, E.N., Soukoulis, C.M. Electromagnetic shielding effectiveness and mechanical properties of graphite-based polymeric films. *Applied Physics A: Materials Science and Processing*, 122 (9) (2016), art. no. 802.

2017

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- A34. Patsaoura, A., Giannakas, A., Ladavos, A., **Barkoula, N.-M.** Thermomechanical response of chitosan based nanocomposite films using oils as plasticizer 7th Hellenic Conference on Thermal Analysis (THERMA 2016), Ioannina, GR, 27-29 May 2016 (poster presentation).

2017

- A35. Bousnaki, M., Bakopoulou, A., Papadogianni, D., **Barkoula, N.-M.**, Kritis, A., Chatzinikolaidou M., Koidis, P. Assessment of dental pulp stem cells differentiation on chitosan-alginate scaffolds targeting temporomandibular joint disc regeneration, 28th Annual Conference of the European Society for Biomaterials (ESB), Athens, GR, 4-8 Sept 2017 (poster presentation).
- A36. Papadogianni, D., **Barkoula, N.-M.**, Chatzinikolaidou M. Alginate - chitosan scaffolds for bone tissue regeneration, 28th Annual Conference of the European Society for Biomaterials (ESB), Athens, GR, 4-8 Sept 2017 (poster presentation).
- A37. Boura-Theodoridou, O., Giannakas, A., Katapodis, P., Stamatis, H., Ladavos, A., **Barkoula, N.-M.** Effect of ZnO growth on the morphological, mechanical, barrier and antimicrobial properties of chitosan based films for food packaging applications, European Congress and Exhibition on Advanced Materials and Processes (EUROMAT), Thessaloniki, GR, 17-22 Sept 2017 (oral presentation).

2018

- A38. Bousnaki, M., Bakopoulou, A., Papadogianni, D., Georgopoulou, A., **Barkoula, N.-M.**, Kritis, A., Chatzinikolaidou M., Koidis, P. Natural Biomaterials and Dental Stem Cells targeting fibrocartilage tissue regeneration, 96th General Session and Exhibition of the IADR (International Association for Dental Research), London, UK, 25-28 July 2018 (oral presentation - 1st Senior Robert Frank Award - Basic Science).

- A39. Chatzinikolaidou M., Bousnaki, M., Bakopoulou, A., Papadogianni, D., **Barkoula, N.-M.**, Kritis, A., Koidis, P. Chitosan/Alginate scaffolds and dental stem cells towards temporomandibular disc regeneration, 5th Termis World Congress, Kyoto, Japan, 4-7 Sept 2018 (poster presentation).
- A40. Alafogianni, P., Tragazikis, I., Balaskas, A., **Barkoula, N.-M.** Effect of environmental loading on the transport properties of CNT modified cement mortars, 5th International Conference of Engineering Against Failure (ICEAF V), Chios Island, GR, 20 - 22 June 2018 (oral presentation)
- A41. Tragazikis, I., Balaskas, A., Alafogianni, P., **Barkoula, N.-M.** Effect of CNTs dispersion on the structural integrity and damage capability of cement mortars after exposure to environmental loadings, 18th International Conference on Experimental Mechanics (ICEM 2018), Brussels, Belgium, 1-5 July 2018 (oral presentation).
- A42. **Barkoula, N.-M.** Study of the environmental degradation of polymers, composites and nanocomposites using dynamic mechanical analysis, 8th Hellenic Conference on Thermal Analysis (THERMA 2018), Athens, GR, 12-13 Oct 2018 (invited talk).
- 2019**
- A43. Alafogianni P., Tragazikis I., Balaskas A., **Barkoula N.-M.** Effect Of Freeze-Thaw On Compressive And Fracture Properties Of CNT - Modified Cement Mortars, 12th International Conference on Composites Science and Technology, Sorrento, Italy, 8-10 May 2019 (oral presentation).
- A44. Alafogianni, P., **Barkoula, N.-M.** Environmental durability of carbon nanotube modified mortars, XXXIV Panhellenic Conference on Solid State Physics and Materials Science, Patras, GR, 11-14 September 2019 (invited talk).