

MEHMET ÇOPUROĞLU

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Research Interests

Materials chemistry; polymer science and technology:

- Inorganic/organic hybrid materials; polymer nanocomposites; ceramics
- Sol-gel synthesis; polymerisation/crosslinking techniques
- Thin-film deposition and processing
- Materials characterisation; instrumental analysis
- Degradation and stability of materials

Education

- PhD: Microelectronic engineering, National University of Ireland, Cork, Ireland, 2008; thesis title: "*Development of polymer/nanocomposite thin films*"; supervisors: Prof. Gabriel M. Crean, Dr. Shane O'Brien
- MSc: Chemistry, Hacettepe University, Turkey, 2001; thesis title: "*Ageing characteristics of ethylene-vinyl acetate copolymer and ethylene-vinyl acetate/carbon black mixture*"; supervisor: Asst. Prof. Murat Şen
- BSc: Chemistry, Hacettepe University, Turkey, 1999

Language Knowledge

- Turkish: Mother tongue
- English: Fluent
- German: Elementary

Scholarship/Grant

- 2012-present: Scholarship by The Scientific & Technological Research Council of Turkey (TÜBİTAK) under The Support Program for Scientific and Technological Research Projects-1001
- 2010-2011: Scholarship by TÜBİTAK National Postdoctoral Research Scholarship Programme-2218
- 2005-2008: Grant by The Irish Government, Department of Education and Science through the Higher Education Authority Programme for Research in Third Level Institutions

Training/Internship

- 2007 (April): The Jožef Stefan Institute, Electronic Ceramics Department, Ljubljana, Slovenia (training for laboratory skills in preparation and characterisation of sol-gel-derived ceramic systems)
- 1997 (July-August): The Turkish Atomic Energy Authority, Ankara, Turkey (undergraduate internship)

Professional Experience

- 2012-present: Senior postdoctoral associate, Department of Chemistry, Bilkent University, Ankara, Turkey:
Preparing and performing characterisation and comprehensive surface chemical analyses of a range of polymeric and ceramic material systems using various instrumental techniques such as X-ray photoelectron spectroscopy; supervising postgraduate and undergraduate students.
- 2010-2011: Postdoctoral researcher/research assistant, Department of Chemistry, Hacettepe University, Ankara, Turkey:
Carried out research on the development of polymer nanocomposite-based material systems via the sol-gel synthesis method and polymerisation/crosslinking process techniques for dental restoration/adhesion applications, performed materials characterisation including in-vitro clinical tests, and demonstrated the potential applicability of these systems as dental adhesive materials.
- 2008-2010: Research assistant/postdoctoral researcher, Tyndall National Institute, Cork, Ireland:
Developed lead-magnesium-niobium titanate-based material systems for potential ultra-high value capacitor applications by the sol-gel synthesis method and various thin-film processing techniques including rapid thermal annealing, UV-irradiation, and laser-activation, and performed materials characterisation; supervised postgraduate students.
- 2005-2008: Postgraduate researcher, Tyndall National Institute, Cork, Ireland:
Synthesised silicon-based and epoxy-functional inorganic-organic, and zinc oxide-based hybrid material systems by the sol-gel method and/or polymerisation/crosslinking techniques, deposited and processed their thin-films, and characterised their properties for potential optical waveguiding, and transparent conducting oxide applications, respectively.
- 2001-2005: Instrumental specialist, Department of Chemistry, Hacettepe University, Ankara, Turkey:
Managed the Central Analysis Laboratories; operated analytical instruments including NMR, FT-IR and UV/vis spectrometers.
- 2000-2001: Teaching assistant, Department of Chemistry, Hacettepe University, Ankara, Turkey:
Led General Chemistry and Computer Laboratories; supervised undergraduate students.
- 1999-2001: Postgraduate researcher, Polymer Chemistry Division, Department of Chemistry, Hacettepe University, Ankara, Turkey:
Investigated the accelerated thermal- and UV-ageing of an *ethylene-vinyl acetate copolymer* (EVA) and an EVA/carbon black mixture; examined the influences of gamma-radiation on the ageing characteristics of these materials.
- 1999-2004: Staff, Laboratories for Radiation & Polymer Science, Department of Chemistry, Hacettepe University, Ankara, Turkey:
Performed chemical analyses of a variety of commercial products.

- 1997-1998: Undergraduate researcher, Polymer Chemistry Division, Department of Chemistry, Hacettepe University, Ankara, Turkey:
Studied gamma-radiation-synthesis of hydrogels; assessed their controlled drug delivering functions.

Project Participations

- Project "*Eco-Electronics*" funded by the Irish Government, Department of Education and Science, through the Higher Education Authority Programme for Research in Third Level Institutions
- European Union project "*Multicomponent Oxides for Flexible and Transparent Electronics*" (project acronym: MULTIFLEXIOXIDES; FP6-2004-NMP-TI-4)
- European Union project "*UV-assisted Technologies for Multifunctional Materials Production*" (project acronym: UVTech; NMP-2002-3.4.2.2-1)
- European Union project "*Monolithic Above IC Ultra High Value Capacitors for Mobile and Wireless Communication Systems*" (project acronym: CAMELIA; NMP3-CT-2006-033103)
- TÜBİTAK project "*Development of Novel Polymer Nanocomposites for Dental Restorative Materials*" (project acronym: DİP)

Publications and Presentations

- 29 publications and 8 presentations (a full list attached below)
- Sum of times cited: 114; h-index: 7 (Web of Knowledge; 08 April 2013)

References

- Prof. Gabriel M. Crean, PhD supervisor; Division of Technological Research of the Atomic Energy and Alternative Energies Commission (CEA), Grenoble, France, gabriel.crean@cea.fr.
- Dr. Shane O'Brien, PhD supervisor; Tyndall National Institute, Cork, Ireland, shane.obrien@tyndall.ie.
- Dr. Richard Winfield, postdoc supervisor; Tyndall National Institute, Cork, Ireland, richard.winfield@tyndall.ie.
- Prof. Murat Şen, undergraduate study/MSc/postdoc supervisor; Polymer Chemistry Division, Department of Chemistry, Hacettepe University, Ankara, Turkey, msen@hacettepe.edu.tr.

ANNEX

Journal Publications

- M. Çopuroğlu, M. Şen, "Evaluation of microstructural and nanostructural properties of a Ti- or Zr-containing silicate-based epoxy-functional polymer nanocomposite system", **Journal of Applied Polymer Science**, under review.
- M. Çopuroğlu, M. Şen, "Light-curing of a sol-gel-derived silicate-based epoxy-functional polymer nanocomposite material system", **Radiation Physics and Chemistry**, under review.
- M. Çopuroğlu, M. Şen, "Identification of the relationship between the synthesis/process parameters and materials properties of a sol-gel derived organically modified silicate-based material system with epoxy functionality", **Journal of Applied Polymer Science**, doi: 10.1002/APP.39129.
- W. Chen, K. G. McCarthy, S. O'Brien, M. Çopuroğlu, M. Cai, R. Winfield, A. Mathewson, "Effect of processing options on ultralow-loss lead-magnesium-niobium titanate thin films for high density capacitors", **Thin Solid Films**, doi: 10.1016/j.tsf.2012.12.092.
- M. Çopuroğlu, M. Şen, "Ultraviolet-radiation-curing of an organically modified silicate-based material system with epoxy functionality, and the role of titanium", **Radiation Physics and Chemistry** 81 (2012) 1324.
- W. Chen, K. G. McCarthy, A. Mathewson, M. Çopuroğlu, S. O'Brien, R. Winfield, "Capacitance and S-parameter techniques for dielectric characterization with application to high-k PMNT thin-film layers", **IEEE Transactions on Electron Devices** 59 (2012) 1723.
- W. Chen, K. G. McCarthy, M. Çopuroğlu, S. O'Brien, R. Winfield, A. Mathewson, "Temperature behavior of electrical properties of high-k lead-magnesium-niobium titanate thin-films", **Thin Solid Films** 520 (2012) 4523.
- M. Çopuroğlu, S. O'Brien, B. Malič, B. Kužnik, M. Kosec, X. Zhu, E. Defaÿ, H. Doyle, R. Winfield, "Evaluation of process parameters and nanoparticle-seeding of sol-gel-derived lead-magnesium-niobium titanate thin-films", **Advances in Applied Ceramics** 110 (2011) 490.
- S. O'Brien, M. Çopuroğlu, P. Tassie, M. G. Nolan, J. A. Hamilton, I. Povey, L. Pereira, R. Martins, E. Fortunato, M. E. Pemble, "The effect of dopants on the morphology, microstructure and electrical properties of transparent zinc oxide films prepared by the sol-gel method", **Thin Solid Films** 520 (2011) 1174.
- W. Chen, K. G. McCarthy, M. Çopuroğlu, H. Doyle, B. Malic, B. Kuznik, M. Kosec, S. O'Brien, R. Winfield, A. Mathewson, "Effect of nanoparticles on ferroelectric and electrical properties of novel PMNT thin-films", **Thin Solid Films** 519 (2011) 5800.
- W. Chen, K. G. McCarthy, A. Mathewson, M. Çopuroğlu, S. O'Brien, R. Winfield, "High-performance MIM capacitors using novel PMNT thin films", **IEEE Electron Device Letters** 31 (2010) 996.
- S. O'Brien, M. G. Nolan, M. Çopuroğlu, J. A. Hamilton, I. Povey, L. Pereira, R. Martins, E. Fortunato, M. Pemble, "Zinc oxide thin films: Characterization and potential applications", **Thin Solid Films** 518 (2010) 4515.
- M. Çopuroğlu, S. O'Brien, B. Malič, B. Kužnik, M. Kosec, X. Zhu, E. Defaÿ, R. Winfield, "UV-/thermal processing of sol-gel-derived lead-magnesium-niobium titanate thin films", **Thin Solid Films** 518 (2010) 4503.

- M. Çopuroğlu, S. O'Brien, G. M. Crean, "Reproducibility evaluation and Al doping of sol-gel-derived single- and multi-layer zinc oxide thin films", **Applied Surface Science** 256 (2009) 737.
- M. Çopuroğlu, L. H. K. Koh, S. O'Brien, G. M. Crean, "Comparative characterisation of zinc oxide thin films prepared from zinc acetate with or without water of hydration via the sol-gel method", **Journal of Sol-Gel Science and Technology** 52 (2009) 432.
- M. Çopuroğlu, S. O'Brien, G. M. Crean, "Sol-gel synthesis, comparative characterisation, and reliability analyses of undoped and Al-doped zinc oxide thin films", **Thin Solid Films** 517 (2009) 6323.
- S. O'Brien, M. Çopuroğlu, G. M. Crean, "Effects of refractive index modifiers and UV light on an epoxy-functional inorganic-organic hybrid sol-gel derived thin film system", **Applied Surface Science** 253 (2007) 7969.
- M. Çopuroğlu, S. O'Brien, G. M. Crean, "Effect of preparation conditions on the thermal stability of an epoxy-functional inorganic-organic hybrid material system doped with Zr", **Thermochimica Acta** 452 (2007) 7.
- S. O'Brien, M. Çopuroğlu, G. M. Crean, "Preparation and characterisation of an epoxy-functional inorganic-organic hybrid material system with phenyl side group for waveguiding applications", **Thin Solid Films** 515 (2007) 5439.
- M. Çopuroğlu, S. O'Brien, G. M. Crean, "Effect of preparation conditions on the thermal stability of an epoxy-functional inorganic-organic hybrid material system with phenyl side group", **Polymer Degradation and Stability** 91 (2006) 3185.
- M. Çopuroğlu, S. O'Brien, G. M. Crean, "Effect of preparation conditions on the optical and physical properties of an epoxy-functional inorganic-organic hybrid material system", **Journal of Sol-Gel Science and Technology** 40 (2006) 75.
- M. Şen, M. Çopuroğlu, "Influence of gamma irradiation on the ageing characteristics of poly(ethylene-co-vinyl acetate) and poly(ethylene-co-vinyl acetate)/carbon black mixture", **Journal of Thermal Analysis and Calorimetry** 86 (2006) 223.
- M. Şen, M. Çopuroğlu, "A comparative study of gamma irradiation of poly(ethylene-co-vinyl acetate) and poly(ethylene-co-vinyl acetate)/carbon black mixture", **Materials Chemistry and Physics** 93 (2005) 154.
- M. Çopuroğlu, M. Şen, "A comparative study of UV ageing characteristics of poly(ethylene-co-vinyl acetate) and poly(ethylene-co-vinyl acetate)/carbon black mixture", **Polymers for Advanced Technologies** 16 (2005) 61.
- M. Çopuroğlu, M. Şen, "A comparative study of thermal ageing characteristics of poly(ethylene-co-vinyl acetate) and poly(ethylene-co-vinyl acetate)/carbon black mixture", **Polymers for Advanced Technologies** 15 (2004) 393.

Conference Proceedings

- W. Chen, K. G. McCarthy, M. Çopuroğlu, S. O'Brien, R. Winfield, A. Mathewson, "Electrical characterization of novel PMNT thin-films", **IEEE International Conference on Microelectronic Test Structures** (2010) 98.
- M. Çopuroğlu, S. O'Brien, B. Malič, B. Kužnik, M. Kosec, X. Zhu, E. Defaÿ, R. Winfield, "Sol-gel-derived lead-magnesium-niobium titanate thin films for ultrahigh-value capacitor applications", **IOP Conference Series: Materials Science and Engineering** 8 (2010) 012007.
- W. Chen, K. G. McCarthy, M. Çopuroğlu, S. O'Brien, R. Winfield, A. Mathewson, "Modelling and characterisation of high-k dielectric thin-films using microwave techniques", **IOP Conference Series: Materials Science and Engineering** 8 (2010) 012020.
- S. O'Brien, L. H. K. Koh, M. Çopuroğlu, G. M. Crean, "Structural and physical characterisation of zinc oxide thin films prepared from zinc acetate via the sol-gel method", in *Zinc Oxide and Related Materials*, edited by D. P. Norton, C. Jagadish, I. Buyanova, G.-C. Yi, **Materials Research Society Symposium Proceedings** 1035E (2008) L05-09.

Conference Presentations

- 12th Tihany Symposium on Radiation Chemistry, Zalakaros, Hungary, 27 August-1 September 2011 (1 talk)
- Materials Ireland 2nd Annual Conference, Cork, Ireland, 14-15 December 2009 (1 poster)
- Euromat, European Congress on Advanced Materials and Processes, Glasgow, Scotland, UK, 7-10 September 2009 (1 poster)
- *The European Materials Research Society* (E-MRS) Spring Meeting, Strasbourg, France, 8-12 June 2009 (2 talks)
- E-MRS Spring Meeting, Strasbourg, France, 26-30 May 2008 (1 poster)
- Polymer Processing Society, Regional Meeting, Antalya, Turkey, 22-24 October 2001 (1 poster)
- 15th National Chemistry Congress, İstanbul, Turkey, 4-7 September 2001 (1 poster)