



Prof. Dr. Mahmoud Al-Hussein



Full Professor of Physics
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Education

Oct. 1996 to Jan. 2000 Interdisciplinary Research Centre (IRC) of Polymer Science and Technology,
Department of Physics, University of Leeds, Leeds, UK

Ph.D. in Polymer Physics

“Mechanical Behaviour of Oriented Polyethylenes”

Supervised by Professors I. M. Ward and G. R. Davies

Sep. 1992 to June 1995 Department of Physics, The University of Jordan,
Amman, Jordan

M.Sc. in Physics

“Photoacoustic Spectroscopy of Multilayered Samples by Front Illumination”.

Supervised by Professor I. S. Shahin

Sep. 1988 to June 1992 Department of Physics, Yarmouk University,
Irbid, Jordan

B.Sc. in Physics

Sep. 1987 to June 1988 Irbid Secondary School,
Irbid, Jordan

High School Diploma (AGP: 88.8%)

Work Experience

Oct. 2018 to Present **Vice Dean:** School of Science, The University of, Amman, Jordan.

Nov. 2017 to Present **Head:** University of Jordan Nano Center Council, The University of Jordan, Amman, Jordan.

Sep. 2016 to Oct. 2018 **Head:** Physics Department, The University of Jordan, Amman, Jordan.

Sep. 2015 Present	to	Full Professor: Physics Department, The University of Jordan, Amman, Jordan.
Sep. 2013 Sep. 2014	to	Visiting Professor: Leibniz Institute of Polymer Research Dresden, Dresden, Germany.
Sep. 2011 Sep. 2015	to	Associate Professor: Physics Department, The University of Jordan, Amman, Jordan.
July 2010 Sep. 2012	to	Assistant Dean for Development Affairs: Faculty of Science, The University of Jordan, Amman, Jordan.
Sep. 2005 Sep. 2011	to	Assistant Professor: Physics Department, The University of Jordan, Amman, Jordan.
Oct. 2002 Jan 2005	to	Research Fellow: FOM-Institute for Atomic and Molecular Physics, Amsterdam, The Netherlands.
Jan. 2000 Sep. 2002	to	Research Fellow: Fakultät für Physik, University of Freiburg, Germany.
Jan. 2001 Sep. 2002	to	Tutor: Fakultät für Physik, University of Freiburg, Germany.
Oct. 1996 Sep. 1999	to	Teaching Assistant: Physics Department, University of Leeds. UK.
July 1995 Sep. 1996	to	Teaching assistant: Physics Department, the Jordan University of Science & Technology, Jordan.
Sep. 1992 Sep. 1995	to	Teaching assistant: Physics Department, the University of Jordan, Jordan.

Awards & Fellowships

Aug. 2018 to Sep. 2018		Visiting Professor, Leibniz Institute of Polymer Research Dresden, Dresden, Germany.
July 2017 Sep. 2017	to	Visiting Professor, Leibniz Institute of Polymer Research Dresden, Dresden, Germany.
Jan. 2017 Jan. 2017	to	Erasmus+ grant, PhD course lecturer, Lund University, Lund, Sweden.
Aug. 2016 Sep. 2016	to	Visiting Professor, Leibniz Institute of Polymer Research Dresden, Dresden, Germany.
June 2015 Sep. 2015	to	Visiting Professor, Leibniz Institute of Polymer Research Dresden, Dresden, Germany.
June 2012 Sep. 2012	to	Visiting scientist, Physics Department, TU München, Germany. Grant provided by the Erasmus Mundus Mamaself Project.
June 2011 Sep. 2011	to	Visiting scientist, Physics Department, TU München, Germany. Grant provided by the TU München, Physik Department.
June 2009 Sep. 2009	to	Visiting scientist, Physics Department, LMU, Germany. Grant provided by the DFG
Feb. 2008	to	Fellowship provided by the IAEA spent at the Physics Department , TU

Sep. 2008 München, Germany.
Oct. 1996 to Sep. 1999 Partial scholarship from the Physics Department, University of Leeds.
Oct. 1996 to Sep. 1999 Partial scholarship from the Arab-British Charitable Foundation.

Research Interests

- Preparation of nanostructured materials and nano patterned surfaces using self-assembling systems.
- Organic solar cells.
- Fuel cells and proton exchange membranes.
- Order in thin films and advanced X-ray scattering techniques using synchrotron radiation.
- Structural formation mechanisms, tensile deformation mechanisms, mechanical properties, and stability of semicrystalline polymers.

Committees

- **Organizing Committee** of the Fourth International Symposium on Dielectric Materials and Applications ISyDMA4, chairman, May 2 – 4, 2019, Amman, Jordan.
- **Organizing Committee** of the 9th International Petra School of Physics, chairman, October 9 - 12, 2018, Amman, Jordan.
- **Utilization Steering Committee** of the Jordan Training and Research Reactor, member, 2017-present.
- **Founding Committee** of the Nano Center at the University of Jordan, chairman, 2016- present.
- **Graduate Studies Committee**, School of Science, University of Jordan, chairman, 2018- present.
- **Scientific Research Committee**, School of Science, University of Jordan, chairman, 2018- present.
- **Technical Committee** of the National Nano Center in Jordan, member, 2016.
- **Organizing Committee** of the Jordanian Life Sciences for Sustainable Development Int. Conference / Humboldt Kolleg, 2017, member, April 27 - 29, Amman, Jordan.
- **International Advisory Committee** of the Second International Conference on Advanced Materials, member, July, 2017, Irbid, Jordan.
- **PhD Qualifying Exam Committee**, Physics Department, University of Jordan, chairman, 2016-2018.
- **ABET Accreditation Committee**, School of Science, University of Jordan, member, 2016- 2018.

- **International Advisory Committee** of the International Conference on Advanced Materials, 27 –29 April, 2015, Irbid, Jordan.
- **Organizing Committee** of The Nanotechnology Conference, member, 10 – 13 November 2008, Amman, Jordan.
- **Founding Committee** of the Materials Science and Technology Program, University of Jordan, member, 2005.

Taught Courses

Undergraduate	Graduate
<ul style="list-style-type: none"> • Solid state physics 	<ul style="list-style-type: none"> • Advanced solid state physics
<ul style="list-style-type: none"> • Materials physics 	<ul style="list-style-type: none"> • Properties of materials
<ul style="list-style-type: none"> • Polymer physics • Modern physics • Advanced practical physics lab 	<ul style="list-style-type: none"> • PhD course on Soft Organic Nanostructured Materials and Their Investigation Using Advanced X-ray Scattering Techniques. Lund University, Sweden.
<ul style="list-style-type: none"> • General physics and General physics for medical school students 	

Graduate Students Supervision

- Supervisor of M.Sc. student Malak Elsharif, University of Jordan: Thesis Title: "**The photovoltaic characteristics of solar cells based on ternary P3HT:PCBM:Ruthenium dye**", 2018–.
- Supervisor of M.Sc. student Samah Akel, University of Jordan: Thesis Title: "**The Nanomorphology of solar cells based on ternary P3HT:PCBM:Ruthenium dye** ", 2018–.
- Supervisor of Ph.D. student Ali Jaffal, University of Jordan: Thesis Title: "**Electrical, mechanical and morphological characteristics of polyethylene-carbon nanotubes nano composites**", 2017–.
- Supervisor of Ph.D. student Murad Ghanem, University of Jordan: Thesis Title: "**Controlling the morphology of bulkheterojunction organic solar cells**", 2017–.
- Supervisor of M.Sc. student Razan El-Asseili, University of Jordan: Thesis Title: "**Preparation and investigation of bulkheterojunction organic solar cells**", 2015–2017.
- Co-supervisor of Ph.D student Eman Hwaitat, University of Jordan: Thesis Title: "**Fabrication and characterization of powder and thin films of Z-type Hexaferrites**", 2015–2017.
- Supervisor of M.Sc. student Hasan Aideh, University of Jordan: Thesis Title: "**Conductivity measurements of sulfonated polyimides proton exchange membranes**", 2015–2017.

- Supervisor of M.Sc. student Ghada El-Madani, University of Jordan: Thesis Title: "**Development of test system for hydrogen proton exchange membrane fuel cells**", 2011–2012.
- Supervisor of M.Sc. student Maysam El-Balbisi, University of Jordan: Thesis Title: "**Preparing nanostructures using diblock copolymers**", 2010–2011.

Under Graduate Students Supervision

- Thesis Advisor and supervisor of B.Sc. students Essra Malkawi and Rand Alshab, University of Jordan: Thesis Title: "**Nanostructuring of spinel $BaFe_2O_3$** ", 2019.
- Thesis Advisor and supervisor of B.Sc. students Eman and Noaimat, University of Jordan: Thesis Title: "**Preparation of TiO_2 nano fibers using electrospinning technique**", 2018.
- Thesis Advisor and supervisor of B.Sc. students Khaled Shaar, Mohammed Hussein and Nidal Sirsawi, University of Jordan: Thesis Title: "**Investigation of the structural, thermal and mechanical properties of high density polyethylene**", 2018.
- Thesis Advisor and supervisor of B.Sc. student Issa Al-Khateeb, University of Jordan: Thesis Title: "**Structural investigation of sulfonated polyimide proton exchange membranes**", 2013.
- Thesis Advisor and supervisor of B.Sc. student Issa Machamreh, University of Jordan: Thesis Title: "**Ionic conductivity measurements of sulfonated polyimide proton exchange membranes**", 2013.
- Thesis Advisor and supervisor of B.Sc. student Asma' Al-Suradi, University of Jordan: Thesis Title: "**Characterization of fluorinated liquid crystal/amorphous diblock copolymer thin films**", 2012.
- Thesis Advisor and supervisor of B.Sc. students Anisah Haswa and Isra Abukhadija, University of Jordan: Thesis Title: "**Preparation of super hydrophobic polymer coatings**", 2011.

Reviewing

- ACS Applied Materials & Interfaces, ACS
- Thin Solid Films, Elsevier
- Jordan Journal of Physics
- Research on Chemical Intermediates, Springer
- Polymer Bulletin, Springer
- Molecules, MDPI AG
- Polymer Chemistry, RSC Publishing
- Macromolecular Rapid Communications, WILEY-VCH Verlag GmbH & Co. KGaA,
- Journal of Polymer Engineering, De Gruyter
- Dirasat, University of Jordan, Deanship of Academic Research
- The Jordan Scientific Research Fund

- The Palestine Scientific Research Fund

Memberships

- Materials Research Society, 2010-2011
- American Nano Society 2011-
- Jordanian Physics Society 2017-

Areas of Expertise

Soft condensed matter and nanoscale self-assembly, Nanopatterned surfaces, Organic solar cells, Ordering in thin films: X-ray reflectivity, Grazing incidence X-ray scattering (GISAXS and GIWAXS) using synchrotron radiation, Small and wide angle X-ray scattering, Atomic Force Microscopy (AFM), Optical light microscopy, Electrochemical impedance spectroscopy, Preparing, Characterising and composite modelling of oriented semicrystalline polymers, Differential scanning calorimetry (DSC), Creep and stress relaxation measurements, Dynamic tensile and shear measurements, Experience in teaching Physics and Material science courses, Preparing for the **accreditation** of the BSc program of the Physics Department by the Applied and Natural Science Accreditation Committee of **ABET**, Spoken languages: **Arabic** (mother language), **English** (excellent verbal and writing skills), **German** (good verbal skills), **Dutch** (basic knowledge).

Referees

- Professor G. Strobl, Institute of Physics, Faculty of Mathematics and Physics, Albert-Ludwig-University of Freiburg, Hermann-Herder-Str. 3, 79104 Freiburg, Germany, Tel.: +49 761 203 97777 Fax: +49 761 203 5855, Email: strobl@uni-freiburg.de
- Professor I. M. Ward, FRS, Department of Physics, University of Leeds, Leeds LS2 9JT, UK. Tel: +44(0)1133433809 Fax: +44(0)1133433846, Email: i.m.ward@leeds.ac.uk
- Professor Manfred Stamm, Leibniz Institute of Polymer Research Dresden, Hohe Strasse 6, 01069, Dresden, Germany, Tel:+49 (0)351 4658 225, Fax: +49 (0)351 4658 281, Email: stamm@ipfdd.de
- Professor Issa Shahin, University of Jordan, Physics Department, Amman 11942, Jordan, Tel: 00962777424451, Email: ishahin20@gmail.com
- Professor Humam Ghassib, University of Jordan, Physics Department, Amman 11942, Jordan, Tel: 00962777872122, Email: hghassib@orange.jo
- Professor Sami Mahmood, University of Jordan, Physics Department, Amman 11942, Jordan, Tel: 00962796709673, Email: s.mahmood@ju.edu.jo

Publications of Mahmoud Al-Hussein

1. "Structural and magnetic properties of $Ba_3[Cu_{0.8-x}Zn_xMn_{0.2}]_2Fe_{24}O_{41}$ Z-type hexaferrites", E. S. Alhwaitat, S. H Mahmood, M. Al-Hussein, I. Bsoul, **Adv. Mater. Sci. Eng.**, 2018, Article ID 6152020, (2018).
2. "Fabrication and characterization of $Ba_3Zn_2Fe_{24}O_{41}$ (Zn_2Z) hexaferrites films on silicon substrates", E. S. Alhwaitat, M. Al-Hussein, S. H. Mahmood, I. Bsoul, **J. Alloys and Compounds**, 763, 71-77 (2018).
3. "Hexacyano-[3]-radialene anion-radical salts: a promising family of highly soluble p-dopants" Y. Karpov, N. Kiriy, M. Al-Hussein, M. Hamsch, S. Mannsfeld, B. Voit, A. Kiriy, **Chemical Communications**, 54, 307-310, (2018).
4. "Effects of synthesis route on the structural and magnetic properties of $Ba_3Zn_2Fe_{24}O_{41}$ (Zn_2Z) nanocrystalline hexaferrites", E. S. Alhwaitat, S. H Mahmood, M. Al-Hussein, O. E. Mohsen, Y. Maswadeh, I. Bsoul, A. Hammoudeh, **Ceramics International**, 44, 779-787, (2018).
5. "Sulfonated polyimide copolymers based on 4,4'-diaminostilbene-2,2'-disulfonic acid and 3,5,3',5'-tetramethylbenzidine with enhanced solubility", M. H. Kailani, B. A. Sweileh, F. M. Abu-Orabi, M. Y. Mustafa, M. Al-Hussein, **Polymer Bulletin**, 74, 895-909 (2017).
6. "The impact of molecular weight, air exposure and molecular doping on the charge transport properties and electronic defects in dithienyl-diketopyrrolopyrrole-thieno[3,2-b]thiophene copolymers", R. Di Pietro, T. Erdmann, N. Wang, X. Liu, D. Gräfe, J. Lenz, J. Brandt, D. Kasemann, K. Leo, M. Al-Hussein, K. L. Gerasimov, D. Doblas, D. A. Ivanov, B. Voit, D. Neher, A Kiriy , **Journal of Materials Chemistry C**, 4, 10827(2016).
7. "Structural investigation of P(BPMA/CPPHMA) and P(MMA/BPMA/CPPHMA) copolymers", M. Al-Hussein, A. Berndt, D. Jehnichen, L. Häußler, M. Stamm, D. Pospiech. **Colloid and Polymer Science**, 294, 1475 (2016).
8. "High conductivity in molecularly p-doped diketopyrrolopyrrole-based polymer: The impact of a high dopant strength and good structural order", Yevhen Karpov, Tim Erdmann, M. Al-Hussein, M. Stamm, D. Ivanov, F. Günther, S. Gemming, B. Voit, A. Kiriy, **Advanced Materials**, 28, 6003(2016).
9. "Comparative study of the nanomorphology of spray and spin coated PTB7 polymer:fullerene films",M. Al-Hussein, E. M. Herzig, M. Schindler, F. Löhner, C. M. Palumbiny, W. Wang, S. V. Roth, P. Müller-Buschbaum, **Polymer Engineering and Science**, 56, 889 (2016).
10. "Copolymerization of zinc-activated isoindigo- and naphthalene-diimide based monomers: an efficient route to low bandgap π -conjugated random copolymers with tunable properties", Y. Karpov, R. Tkachov, J. Maiti, T. Beryozkina, V. Bakulev, W. Liu, H. Komber, U. Lappan, M. Al-Hussein, M. Stamm, B. Voit, A. Kiriy, **Polymer Chemistry**, 7, 2691 (2016).
11. "Test system for through-plane conductivity measurements of hydrogen proton exchange membranes", G. Al-Madani, M. H. Kailani, M. Al-Hussein, **Int. J. Electrochem. Sci.**, 10, 6465 (2015).

12. "Methacrylate copolymers with liquid crystalline side chains for organic gate dielectric applications", A. Berndt, D. Pospiech, H. Komber, D. Jehnichen, L. Häußler, B. Voit, M. Al-Hussein, M. Plötner, A. Kumar, W.-J. Fischer, **ACS Applied Materials & Interfaces**, 7, 12339 (2015).
13. "Influence of semiconductor thickness and molecular weight on the charge transport of a naphthalenediimide-based copolymer in thin-film transistors", Y. Karpov, W. Zhao, I. Raguzin, T. Beryozkina, V. Bakulev, M. Al-Hussein, L. Häußler, M. Stamm, B. Voit, A. Facchetti, R. Tkachov, A. Kiriy, **ACS Applied Materials & Interfaces**, 7,12478 (2015).
14. "Dielectric function of a poly(benzimidazobenzophenanthroline) ladder polymer", S. Kraner, C. Koerner, K. Leo, E. Bittrich, K.-J. Eichhorn, Y. Karpov, A. Kiriy, M. Stamm, K. Hinrichs, M. Al-Hussein, **Phys. Rev. B**, 91, 195202 (2015).
15. "Reversible thermosensitive biodegradable polymeric actuators based on confined crystallization", V. Stroganov, M. Al-Hussein, J.-U. Sommer, A. Janke, S. Zakharchenko, L. Ionov, **Nano Letters**, 15, 1786 (2015).
16. "The distribution of immobilized platinum and palladium nanoparticles within poly(2-vinylpyridine) brushes", M. Al-Hussein, M. Koenig, M. Stamm, P. Uhlmann, **Macromolecular Chemistry and Physics**, 215, 1679 (2014).
17. "In-situ X-ray study of the structural evolution of gold nano domains by spray deposition on thin conductive P3HT films", M. Al-Hussein, M. Schindler, M. A. Ruderer, J. Perlich, M. Schwartzkopf, G. Herzog, B. Heidmann, A. Buffet, S. V. Roth, P. Müller-Buschbaum, **Langmuir**, 29, 2490 (2013).
18. "Structural properties of the active layer of discotic hexabenzocoronene/perylene diimide hulk-hetero junction photovoltaic devices: The role of alkyl side chain length", M. Al-Hussein, H. C. Hesse, J. Weickert, L. Doessel, X. Feng, K. Muellen, L. Schmidt-Mende, **ThinSolid Films**, 520, 307 (2011).
19. "Determination of the local gold contact morphology on a photoactive polymer film using nanobeam GISAXS", M. Ruderer, V. Körstgens, E. Metwalli, M. Al-Hussein, U. Vainio, S. V. Roth, R. Döhrmann, R. Gehrke, R. Gebhardt, M. Burghammer, P. Müller-Buschbaum, **Nucl. Instrum. Methods Phys. Res. B**, 268, 403 (2010).
20. "Discotic materials for organic solar cells: Effects of chemical structure on assembly and performance", H. C. Hesse, J. Weickert, M. Al-Hussein, L. Dössel, X. Feng, K. Müllen, L. Schmidt-Mende, **Sol. Energy Mat. Sol. Cells**, 94, 560 (2010).
21. "Determination of the ordered structure in conjugated-coil diblock copolymers films from a thickness gradient prepared by spin-coated drop technique", M. Al-Hussein, M. Ruderer, E. Metwalli, V. Körstgens, U. Vainio, S. V. Roth, R. Döhrmann, R. Gehrke, R. Gebhardt, M. Burghammer, P. Müller-Buschbaum, **Macromolecules**, 42, 4230 (2009).
22. "Crystallization induced order in polystyrene-poly(ethylene oxide) metallo-supramolecular diblock copolymer", M. Al-Hussein, W. H. de Jeu, **Polymer**, 50, 2149 (2009).
23. "Investigating nanoscopic patterned surfaces of a semifluorinated liquid crystalline diblock copolymer using X-ray scattering techniques", M. Al-Hussein Conference:

Materials Research Society Symposium Proceedings; 123-129 Grazing-incidence small-angle X-ray scattering Symposium, Boston, Massachusetts, USA, Volume: 1147 (2008).

24. "Self-assembly of poly(ferrocenyldimethylsilane-*b*-methyl methacrylate) block copolymers in a selective solvent", I. Korczagin, M. A. Hempenius, R. G. Fokkink, M. A. Cohen Stuart, M. Al-Hussein, P. H. H. Bomans, P. M. Frederik, G. J. Vancso, **Macromolecules**, **39**, 2306 (2006).

25. "Liquid crystallinity in block copolymers films for polymeric nanopatterns", W. H. de Jeu, Y. Serero, and M. Al-Hussein, **Adv. Polym. Sci.**, 71, 200 (2006).

26. "Self-assembly of PFS-*b*-PMMA block copolymers in a selective solvent", M. A. Hempenius, I. Korczagin, R. G. Fokkink, M. A. Cohen Stuart, M. Al-Hussein, P. H. H. Bomans, P. M. Frederik, G. J. Vancso, **Polymer Preprints**, 47(1), 437 (2006).

27. "Nano-ordering of fluorinated side-Chain liquid crystalline diblock copolymers", M. Al-Hussein, Y. Serero, O. Konovalov, A. Mourran, M. Möller, W. H. de Jeu, **Macromolecules**, 38, 9610 (2005).

28. "Phase behavior of the melt of polystyrene-poly(ethyleneoxide) metallo-supramolecular diblock copolymer with bulky counterions", M. Al-Hussein, B. G. G. Lohmeijer, U. S. Schubert, and W. H. de Jeu, **Macromolecules**, 38, 2832 (2005).

29. "Bulk and thin film ordering in side-chain liquid crystalline diblock copolymers: the role of chain length", M. Al-Hussein, W.H. de Jeu, L. Vranichar, S. Pispas, N. Hadjichristidis, T. Itoh, and J. Watanabe, **Macromolecules**, 37, 6401 (2004).

30. "Interplay between smectic ordering and microphase separation in a series of side-group liquid-crystal block copolymers", I. W. Hamley, V. Castelletto, Z. B. Lu, C. T. Imrie, T. Itoh, and M. Al-Hussein, **Macromolecules**, 37, 4798 (2004).

31. "Hydrophilic elastomers for microcontact printing of polar inks", D. C. Trimbach, M. Al-Hussein, W. H. de Jeu, M. Decre, D. J. Broer, and C. W. Bastiaansen, **Langmuir**, 20, 4738 (2004).

32. "The stress relaxation behaviour of isotactic poly(1-butene) and its ethylene copolymers", M. Al-Hussein and G. Strobl, **J. Polym. Sci. B: Polym. Phys.**, 42, 2074 (2004).

33. "Bulk morphology of a metallo-supramolecular block copolymer", B.G.G. Lohmeijer, M. Al-Hussein, W. H. de Jeu, J.M.W. Gohy, U.S. Schubert, American Chemical Society. Division of Polymer Chemistry 45(1):464 (2004).

34. "Strain-controlled tensile deformation behavior and relaxation properties of isotactic poly(1-butene) and its ethylene copolymers", M. Al-Hussein and G. Strobl, **Macromolecular Symposia**, 214, 231 (2004).

35. "Melt morphology of polystyrene-poly(ethylene oxide) metallo-supramolecular diblock copolymer", M. Al-Hussein, B. G. G. Lohmeijer, U. S. Schubert, and W. H. de Jeu, **Macromolecules**, 36, 9281 (2003).

36. "On the mechanisms of recrystallization after melting in semicrystalline polymers: The effect of the initial melt state", M. Al-Hussein and G. Strobl, **J. Macromol. Sci. Phys.**, 42, 677 (2003).

37. "A comparative study of the mechanisms of initial crystallization and recrystallization after melting in syndiotactic polypropylene and isotactic polystyrene", M. Al-Hussein and G. Strobl, in: *Polymer Crystallization: Observations, Concepts and Interpretations* / edited by G. Reiter and J.-U. Sommer, Berlin: Springer, p 46-63, (2003).
38. "Strain-controlled tensile deformation behaviour of isotactic poly(1-butene) and its ethylene copolymers", M. Al-Hussein and G. Strobl, **Macromolecules**, 35, 8515 (2002).
39. "Morphological changes during heating semicrystalline polymers to the melt as revealed by SAXS measurements", M. Al-Hussein and G. Strobl, **e-polymers**, no. 038, (2002).
40. "The melting line, the crystallization line and the equilibrium melting temperature of isotactic polystyrene", M. Al-Hussein and G. Strobl, **Macromolecules**, 35, 1672 (2002).
41. "The mechanisms of recrystallization after melting in syndiotactic polypropene and isotactic polystyrene", M. Al-Hussein and G. Strobl, **Eur. Phys. J. E**, 6, 305 (2001).
42. "Preparation of ultra-high modulus materials from metallocene based linear polyethylenes", M. Al-Hussein, G. R. Davies and I. M. Ward, **Polymer**, 42 3679 (2001).
43. "Mechanical properties of oriented low-density polyethylene with an oriented lamellar-stack morphology", M. Al-Hussein, G. R. Davies and I. M. Ward, **J. Polym. Sci. B: Polym. Phys.**, 38, 755 (2000).
44. "On the influence of initial morphology on the internal structure of highly drawn polyethylene" T. Amornsakchai, R. H. Olley, D. C. Bassett, M. Al-Hussein, A. P. Unwin and I. M. Ward, **Polymer**, 41 8291 (2000).