Dr. Ipek AKIN

Assistant Professor

Istanbul Technical University
Department of Metallurgical and Materials Engineering
34469 Maslak Istanbul Turkey

e-mail : akinipe@itu.edu.tr
Phone : +90 212 285 68 95
Fax : +90 212 285 34 27

EDUCATION

Post-Doctoral Researcher	University of Sheffield Department of Materials Science and Engineering 2012-2013 (Aug-Feb)
PhD Degree	Istanbul Technical University (ITU) Metallurgical and Materials Engineering Dept. 2010
Visiting PhD Student	Tohoku University Institute for Materials Research (IMR) 2008 (Jan-July)
MSc Degree	Istanbul Technical University (ITU) Metallurgical and Materials Engineering Dept. 2005
BSc Degree	Anadolu University Materials Science and Engineering Department 2003

ACADEMIC BACKGROUND

Assistant Professor	Istanbul Technical University (ITU) Metallurgical and Materials Engineering Department 2012-Cont.
Research Associate	Istanbul Technical University (ITU) Metallurgical and Materials Engineering Department 2011-2012
Research Assistant	Istanbul Technical University (ITU) Metallurgical and Materials Engineering Department 2004-2011

Doctorate Dissertation

Production and Characterization of ZrB_2 Based Composites Prepared by Spark Plasma Sintering (SPS), Supervisor: Prof.Dr.Gultekin Goller, Istanbul Technical University, 2010.

Graduate Dissertation

The Effect of Nucleating Agent (TiO_2) Addition on Crystallization Behaviour, Machinability of Potassium Mica and Fluorapatite Containing Glass Ceramics and Bioactivity Characterization, Supervisor: Prof.Dr.Gultekin Goller, Istanbul Technical University, 2005.

Undergraduate Dissertation

Production and Characterisation of SiO_2 Coated Hematite Red Pigments for Porcelainised Stoneware Applications, Supervisor: Prof. Dr. Servet Turan, Anadolu University, 2003.

Research Interests

• Processing techniques include sintering and spark plasma sintering (experienced in using different SPS systems; 7.40 MK VII, SPS Syntex Inc. (ITU), SPS 210LX, SPS Syntex Inc. (Tohoku University), HPD-25/1 FCT Systeme GmbH (University of Sheffield)

• Production and characterization of ultra-high temperature ceramic composites (ZrB_2, SiC, ZrC)

• Perovskite-based functionally graded electroceramics (Ba-doped $EuTiO_3$, Co-doped $BaTiO_3$, La-doped $SrTiO_3$) and impedance spectroscopy (IS) measurements

• Bioactive (Bioglass, HA) and bioinert ceramics (Al_2O_3-YSZ binary and Al_2O_3-YSZ-CNT/CeO_2/TiO_2 ternary composites)

• Machinable glass-ceramics (K-mica based materials with different nucleating agents)

PUBLICATIONS

Articles Published in International Peer-Review Periodicals (SCI)

1) S. Cavalu, F. Banica, V. Simon, **I. Akin**, G. Goller, "Surface modification of alumina/zirconia ceramics upon different fluoride-based treatments", International Journal of Applied Ceramic Technology, doi: 10.1111/ijac.12075 (2013).

2) M. Ozmen, **I. Akin**, M. Marsoglu, "Production and characterization of hydroxyapatite-zirconia composites", High Temperature Materials and Processes, 31 [6] (2012).

3) I. Akin, G. Goller, "Densification, mechanical properties and oxidation behavior of spark plasma sintered ZrB_2-ZrC-SiC composites", Journal of the Ceramic Society of Japan, 120 [4] 143-149 (2012).

4) I. Akin, E. Yilmaz, F. Sahin, O. Yucel, G. Goller, "Effect of CeO_2 addition on densification and microstructure of Al_2O_3-YSZ composites", Ceramics International, 37 [8] 3273-3280 (2011).

5) S. Cavalu, V. Simon, G. Goller, **I. Akin**, "Bioactivity and antimicrobial properties of PMMA/Ag_2O acrylic bone cement collagen coted", Digest Journal of Nanomaterials and Biostructures, 6 [2] 779-790 (2011).

6) C. Sen, B. Alkan, **I. Akin**, O. Yucel, F.C. Sahin, G. Goller, "Investigation of microstructural properties and ferroelectric behavior of spark plasma sintered Li substituted $K_{0.5}Na_{0.5}NbO_3$ ceramics", Journal of the Ceramic Society of Japan, 119 [5] 355-361 (2011).

7) U. Ceylan, **I. Akin**, G. Goller, "The effect of zirconia addition on crystallization behaviour and machinability of potassium mica and fluorapatite glass-ceramics", High Temperature Materials and Processes, 29 [4] 305-311 (2010).

8) I. Akin, G. Goller, "The effect of CeO_2 addition on crystallization behavior, bioactivity and biocompatibility of potassium mica and fluorapatite based glass ceramics", Journal of the Ceramic Society of Japan, 117 [7] 787-797 (2009).

9) I. Akin, M. Hotta, F.C. Sahin, O.Yucel, G.Goller, T.Goto, "Microstructure and densification of ZrB_2-SiC composites prepared by spark plasma sintering", Journal of the European Ceramic Society, 29 [11] 2379-2385 (2009).

10) G. Goller G, **I. Akin**, "Effect of CeO_2 addition on in-vitro bioactivity properties of K-Mica-Fluorapatite based glass ceramics", Bioceramics 20, PTS 1 and 2 Book Series, Key Engineering Materials, 361-363 [1-2] 261-264 (2008).

11) G. Goller, C. Cekli, **I. Akin**, E. Demirkesen, "In-vitro bioactivity characterization of sodium-potassium mica and fluorapatite containing glass ceramics", Bioceramics 19, Pts 1 and 2 Book Series, Key Engineering Materials, 330-332 [1-2] 185-188 (2007).

12) I. Akin, G. Goller, "Effect of TiO_2 addition on crystallization and machinability of potassium mica and fluorapatite glass ceramics", Journal of Materials Science, 42 [3] 883-888 (2007).

13) G. Goller, **I. Akin**, N. Eruslu, E.S. Kayali, "In-vitro bioactivity characterizaton of K-mica-fluorapatite based glass-ceramics containing varying amount of TiO_2 addition", Bioceramics 18, Pts 1 and 2 Book Series, Key Engineering Materials, 309–311 [1-2] 321-324 (2006).

14) G. Goller, **I. Akin**, A. Kahraman, E. Demirkesen, M. Urgen, "In-vitro bioactivity characterization of machinable glass-ceramics containing 85wt% Na-mica and 15wt% fluorapatite", Bioceramics 18, Pts 1 and 2 Book Series, Key Engineering Materials, 309–311 [1-2] 325-328 (2006).

Articles Published in International Peer-Review Periodicals (Chemistry Citation I.)

1) Z. Zumrut, BD Polat, **I. Akin**, O. Keles, G. Goller, "Bioactivity characterization and a full factorial design on the adhesive strength of air plasma sprayed HA-TiO_2 coated Ti", Journal of the Australian Ceramic Society, 42 [2] 95-103 (2013).

2) S. Cavalu, V. Simon, F. Banica, I. Oswald, E. Vanea, **I. Akin**, G. Goller, "Spectroscopic evidence of collagen electrodeposition on acrylic bone cement", Studia Universitatis Babes-Bolyai Seria Chemia, 56 [3] 27-33 (2011).

3) V.Simon, S.Cavalu, **I.Akin**, O.Yucel, G.Goller, "XRD and FTIR investigation of zirconia-toughened alumina composites", Studia Universitatis Babes-Bolyai Seria Chemia, 56 [1] 67-72 (2011).

Papers Submitted to International Meetings

1) S. Cavalu, V. Simon, C. Ratiu, V. Rus, **I. Akin**, G. Goller, "Titania versus Ceria alumina/zirconia composites: structural aspects and biological tolerance", Bioceramics 24 Proceedings (2012).

2) S. Sagdic, I. **Akin**, F. Sahin, O. Yucel, G. Goller, "Mechanical properties of spark plasma sintered ZrC-SiC composites", TMS 2012 141st Annual Meeting & Exhibition – Supplemental Proceedings, Vol 1: Materials Processing and Interfaces, 569-575 (2012).

3) S. Cavalu, V. Simon, C. Ratiu, I. Oswald, R. Gabor, O. Ponta, **I. Akin**, G. Goller, "Correlation between structural properties and in vivo biocompatibility of alumina/zirconia bioceramics", Bioceramics 23 Proceedings, 1–6 (2011).

4) S. Cavalu, V. Simon, **I. Akin**, G. Goller, "Improving the bioactivity and biocompatibility of acrylic cements by collagen coating", Bioceramics 23 Proceedings, 391–396 (2011).

5) I. Akin, F.C. Sahin, O. Yucel, G. Goller, "Oxidation behavior of zirconium diboride-silicon carbide composites", 34th International Conference on Advanced Ceramics and Composites Proceedings: 105-114 (2010).

6) I. Akin, E. Yilmaz, O. Ormanci, F.C. Sahin, O. Yucel, G.Goller, "Effect of TiO_2 addition on the properties of Al_2O_3-ZrO_2 composites prepared by spark plasma sintering", Bioceramics 22 Proceedings, 361–364 (2009).

7) I. Akin, O. Ormanci, E. Yilmaz, G. Goller, "Synthesis and characterization of chitosan-bioglass composites", Bioceramics 22 Proceedings, 691–694 (2009).

8) G. Goller, A. Seckiner, **I. Akin**, "Production and characterization of potassium mica and cordierite based glass ceramics", TMS 2007 Annual Meeting, Orlando/USA (2007).

Abstracts Published in Proceedings

1) O. Ormanci, **I. Akin**, F. Sahin, O. Yucel, G. Goller, "The role of TiO_2 on densification and mechanical properties of Al_2O_3-YSZ composites", Materials Science & Technology 2012, 7-11 October 2012, Pittsburgh, Pennsylvania/USA (2012).

2) O. Ormanci, **I. Akin**, S. Cavalu, V. Simon, G. Goller, "In vivo evaluation of zirconia toughened alumina ceramics", Materials Science & Technology 2012, 7-11 October 2012, Pittsburgh, Pennsylvania/USA (2012).

3) I. Akin, V. Simon, S. Cavalu, G. Goller, "Processing and in vivo evaluation of spark plasma sintered Al2O3-YSZ-TiO2 composites", TMS 2012, 141st Annual Meeting & Exhibition, 11-15 March 2012, Orlando, Florida/USA (2012).

4) B. Acicbe, **I. Akin**, F. Sahin, O. Yucel, G. Goller, "Effect of TiC addition on sintering behavior of ZrC", TMS 2012, 141st Annual Meeting & Exhibition, 11-15 March 2012, Orlando, Florida/USA (2012).

5) S. Sagdic, **I. Akin**, F. Sahin, O. Yucel, G. Goller, "Mechanical properties of spark plasma sintered ZrC-SiC composites", TMS 2012, 141st Annual Meeting & Exhibition, 11-15 March 2012, Orlando, Florida/USA (2012).

6) I. Akin, F. Sahin, O. Yucel, G. Goller, "Mechanical properties and oxidation behavior of spark plasma sintered ZrB2-ZrC-SiC composites", Materials Science & Technology 2011 Conference & Exhibition", 16-20 October 2011, Columbus, Ohio/USA (2011).

7) G. Goller, **I. Akin**, S. Cavalu, V. Simon, "In vivo evaluation of the spark plasma sintered Al_2O_3-ZrO_2-CeO_2 composites", Materials Science & Technology 2011 Conference & Exhibition", 16-20 October 2011, Columbus, Ohio/USA (2011).

8) S. Cavalu, V. Simon, C. Ratiu, D. Osvat, I. Oswald, M. Puscasiu, O. Ponta, **I. Akin**, G. Goller, "Biocompatibility and osseointegration of alumina/zirconia bioceramics: In vivo study using animal model", 13th Ceramics, Cells and Tissues (CCT): Regenerative Nanomedicine, Tissue and Genetic Engineering and the Role of Ceramics, 17-20 May 2011, Faenza/Italy (2011).

9) S. Cavalu, V. Simon, G. Goller, **I. Akin**, "PMMA/Ag_2O acrylic bone cement with antibacterial properties", 13th Ceramics, Cells and Tissues (CCT): Regenerative Nanomedicine, Tissue and Genetic Engineering and the Role of Ceramics, 17-20 May 2011, Faenza/Italy (2011).

10) V. Simon, S. Cavalu, O. Ponta, **I. Akin**, O. Yucel, G. Goller, "Structural and textural effect of zirconia addition to alumina bioceramics", 13th Ceramics, Cells and Tissues (CCT): Regenerative Nanomedicine, Tissue and Genetic Engineering and the Role of Ceramics, 17-20 May 2011, Faenza/Italy (2011).

11) I. Akin, F. Sahin, O. Yucel, G. Goller G, "Oxidation behavior of spark plasma sintered ZrB2-SiC composites", TMS 2011, 140th Annual Meeting & Exhibition, 27 February-3 March 2011, San Diego, California/USA (2011).

12) I. Akin, F.C. Sahin, O. Yucel, G. Goller, "Oxidation Behavior of ZrB_2-SiC and ZrB_2-ZrC composites", 3rd International Congress on Ceramics, 14-18 November 2010, Osaka, Japan.

13) O. Ormanci, E. Yilmaz, **I. Akin**, F.C. Sahin, O. Yucel, G. Goller, "Effect of TiO_2 addition on the properties of Al_2O_3-ZrO_2 composites prepared by spark plasma sintering", 3rd International Congress on Ceramics, 14-18 November 2010, Osaka, Japan.

14) E. Yilmaz, O. Ormanci, **I. Akin**, F.C. Sahin, O. Yucel, G. Goller, "Densification and mechanical properties of Al_2O_3-ZrO_2-CeO_2 ceramics prepared by spark plasma sintering", 3rd International Congress on Ceramics, 14-18 November 2010, Osaka, Japan.

15) I. Akin, F.C. Sahin, O. Yucel, T. Goto, G. Goller, "Production and characterization of ZrB_2-ZrC-SiC composites by spark plasma sintering", 11th International Conference and Exhibition of the European Ceramic Society, ECERS 2009, 21-25 June 2009, Krakow, Poland.

16) I. Akin, F.C. Sahin, T. Goto, G. Goller, "Densification of ZrB_2-SiC composites by spark plasma sintering (SPS)", 11th International Conference and Exhibition of the European Ceramic Society, ECERS 2009, 21-25 June 2009, Krakow, Poland.

17) C. Sen, B. Alkan, O. Ormanci, **I. Akin**, F.C. Sahin, G. Goller, "Microstructural characterization of spark plasma sintered Li doped KNN piezoceramics", 11th International Conference and Exhibition of the European Ceramic Society, ECERS 2009, 21-25 June 2009, Krakow, Poland.

18) O. Ormanci, H. Menevse, **I. Akin**, G. Goller, "Processing of hydroxyapatite-chitosan composites", 11th International Conference and Exhibition of the European Ceramic Society, ECERS 2009, 21-25 June 2009, Krakow, Poland.

19) I. Akin, F.C. Sahin, O. Yucel, T. Goto, G. Goller, "High-temperature microstructures of ZrB_2-SiC composites prepared by spark plasma sintering", TMS 2009, The Minerals, Metals & Materials Society, 15-19 February 2009, San Francisco, California/USA.

20) I. Akin, F.C. Sahin, O. Yucel, T. Goto, G. Goller, "Preparation of ZrB_2-ZrC composites by spark plasma sintering", TMS 2009, The Minerals, Metals & Materials Society, 15-19 February 2009, San Francisco, California/USA.

21) I. Akin, F.C. Sahin, O. Yucel, T. Goto, G. Goller, "Production and characterization of ZrB_2-ZrC-SiC composites", TMS 2009, The Minerals, Metals & Materials Society, 15-19 February 2009, San Francisco, California/USA.

22) I. Akin, F.C. Sahin, O. Yucel, T. Goto, G. Goller, "Synthesis and characterization of ZrB_2-SiC composites produced by spark plasma sintering (SPS)", Sintering 2008, 16-21 November, La Jolla, California/USA.

23) I. Akin, G. Goller, "Production and characterization of K-mica-fluorapatite based glass ceramics containing varying amount of CeO_2 addition", TMS 2007, The Minerals, Metals & Materials Society, 25 February-1 March 2007, Orlando, Florida/USA.

PROJECTS

1) "Production and Characterization of Spark Plasma Sintered Al_2O_3-YSZ-CNT Composites, ITU Research Foundation, **Project Coordinator**, 2012-Cont.

2) "A New Generation of Alumina/Zirconia Biocomposites for Dental and Orthopedic Implants: Production, Characterization and In Vitro / In Vivo Evaluation", The Scientific and Technological Research Council of Turkey /TUBITAK) - The National Authority for Scientific Research of Romania, **Researcher**, 2012-Cont.

3) "New Acrylic Cements with Antimicrobial Activity for Dental and Orthopedic Implants", The Scientific and Technological Research Council of Turkey-The National Authority for Scientific Research of Romania, **Researcher**, 2010-2011.

4) "Development of Materials/Processing Technologies for Heat Shield Applications", The Scientific and Technological Research Council of Turkey, Researcher, 2007-2010.

5) "Production and Characterization of Spark Plasma Sintered (SPS) ZrB_2 Based Composites", ITU Research Foundation, **Researcher**, 2009-2010.

6) "The Effect of CeO_2 Addition on Crystallization Behavior of Machinable Glass Ceramics", ITU Research Foundation, **Researcher**, 2007-2008.

TEACHING

Year	Semester	Course	Hours	Number of Students
2012-2013	Spring	Biomaterials* (English)	3 + 0	14
		Materials Science (English)	3 + 0	76
		Introduction to Science and Engineering Computing (English)	2 + 2	50
2011-2012	Summer	Materials Science I** (Turkish)	3 + 0	48
	Spring	Materials Science (English)	3 + 0	74
		Principles of Metal Casting and Technologies (English)	3 + 0	40
	Fall	Materials Science (Turkish)	3 + 0	37
		Materials Science (English)	3 + 0	2
		Introduction to Computers and Information Systems (English)	2 + 0	41

*Co-taught with Prof.Dr.Gultekin Goller

**Co-taught with Assoc.Prof.Dr.Ozgul Keles