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### Patents

1. "Polymerized Organic-Inorganic Complex Route for Mixed-Oxide Synthesis," M. A. Gülgün and W. M. Kriven, US patent# 6,482,387
2. "Process for Preparing Superhydrophobic Surface Compositions, Surfaces obtained by said Process and the Use of them", K. Acatay, M. A. Gülgün, and Y. Z. Menceloğlu, WO 2005/021843, 10.03.2005.
3. "Metal Coated Nano Fibers", M. M. Demir, M. A. Gülgün, and Y. Z. Menceloğlu, WO 2005/021845, 10.03.2005.

### **Professional Publications and Papers**

### Journal Articles

1. "Chemical Synthesis and Characterization of Calcium Aluminate Powders," M. A. Gülgün, O. O. Popoola, and W. M. Kriven, Journal of the American Ceramic Society, **77** [2], 531-539 (1994).
2. "XPS Study of Bonding Between Polyvinyl Alcohol and a Titanate Cross Coupling Agent," M. A. Gülgün, W. M. Kriven and O. O. Popoola, Journal of Materials Research, **10** [6], 1565-1571 (1995).
3. "Evolution of Mechano-Chemistry and Microstructure of a Calcium Aluminate-Polymer Composite: Part I. Mixing Time Effects," M. A. Gülgün, W. M. Kriven, L. S. Tan and A. J. McHugh, Journal of Materials Research, **10** [7], 1746-1755 (1995).
4. "Evolution of Mechano-Chemistry and Microstructure of a Calcium Aluminate-Polymer Composite: Part II. Mixing Rate Effects," L. S. Tan, A. J. McHugh, M. A. Gülgün, and W. M. Kriven, Journal of Materials Research, **11** [7], 1739-1747(1996).
5. „Crystallization of Hafnia and Zirconia During the Pyrolysis of Acetate Gels,“ M. Yashima, T. Kato, M. Kakihana, M. A. Gülgün, Y. Matsuo, and M. Yoshimura, Journal Materials Research, **12** [10], 2575-2583 (1997).
6. „Polymerized Organic-Inorganic Synthesis of Mixed Oxides,“ M. A. Gülgün, M. H. Nguyen, and W. M. Kriven, Journal of the American Ceramic Society, **82**, 556-60 (1998).
7. „Orientation Imaging Microscopy of Alpha Alumina: Sample Preparation and Texture Analysis,“ M. L. Mulvihill, M. A. Gülgün, E. Bischoff, and M. Rühle, Zeitschrift für Metallkunde, **89** [8], 546-550 (1998).
8. „Effects of Yttrium Doping Alpha-Alumina: I. Microstructure and Microchemistry,“ M. A. Gülgün, V. Putlayev, and M. Rühle, J. Am. Ceram. Soc., **82** [7], 1849-56( 1999).

9. „Electron states of YAG probed by energy-loss near-edge spectrometry and ab-initio calculations,“ M. A. Gülgün, W-Y. Ching, Y-N. Xu, and M. Rühle, *Phil. Mag. B*, Vol. **79** [6], 921-940 (1999).
10. „Influence of microstructure and microchemistry on the corrosion of zirconia ceramics in aqueous solutions,“ Schacht, M., Boukis, N., Dinjus, E.; Ebert, K., Gülgün, M. A., and Rühle, M., submitted to the *J. Am. Ceram. Soc.* (May, 1999).
11. „A Study of the Microstructure of Y<sub>2</sub>O<sub>3</sub>-Doped Al<sub>2</sub>O<sub>3</sub> with Bi-modal Grain Size Distribution“, Bernhard Fenk, Horst Opielka, Sabine Kühnemann, Mehmet A. Gülgün and Ewald Bischoff, bilingual (in German and English), *Prakt. Metallogr.*, Vol. **36**, 433-445, (1999).
12. „Synthesis of Oxide Powders via Polymeric Steric Entrapment,“ W. M. Kriven, S. J. Lee, M. A. Gülgün, M. H. Nguyen, and D. K. Kim, invited review paper, in *Innovative Processing/Synthesis: Ceramics, Glass, Composites III*, Ceramic Transactions, Vol **108**, 99-110 (2000).
13. “The Effect of Yttrium on Densification and Grain Growth in  $\alpha$ -Alumina”, R. Voytovych, I. MacLaren, M.A. Gülgün, R.M. Cannon, and M. Rühle, *Acta Mater.*, **50** [13] 3453-3463 (2002).
14. “Cation Segregation in an Oxide Ceramic with Low Solubility: Yttrium doped  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> “ M.A. Gulgun, R. Voytovych, I. Maclaren, M. Rühle and R. M. Cannon, *Interface Science* **40**, pp 99-110 (2002).
15. "Abnormal Grain Growth in Alumina: Synergistic Effects of Yttria and Silica," Ian Maclaren, Mehmet A. Gülgün, Raissa Voytovych, Nicoletta Popescu-Pogrion, Ulrike Taeffner, Rowland M. Cannon, and Manfred Rühle, *J. Am. Ceram. Soc.*, **86** [4] 650-59 (2003).
16. “Microstructural Evolution of Calcium Doped  $\alpha$ -Al<sub>2</sub>O<sub>3</sub>,” A. Altay and M. A. Gulgun, *J. Am. Ceram. Soc.*, **86** [4] 623-29 (2003).
17. “Effect of Si-impurity on the abnormal grain growth behaviour in Y-doped  $\alpha$ -Al<sub>2</sub>O<sub>3</sub>,” Sašo Šturm, Mehmet A. Gülgün, Gunther Richter, Francisco M. Morales, Rowland M. Cannon and Manfred Rühle, submitted to *J. Amer. Ceram. Soc.* Jan 2007.
18. “Palladium Nanoparticles by Electrospinning from Poly(acrylonitrile-co-acrylic acid)-PdCl<sub>2</sub> Solutions: Relations between Preparation Conditions, Particle Size, and Catalytic Activity,” Mustafa M. Demir, Mehmet A. Gulgun, Yusuf, Z. Menciloglu, Burak Erman, Sergei S. Abramchuk, Elena E. Makhaeva, Alexei R. Khokhlov, Valentina G. Matveeva, and Mikhail G. Sulman, *Macromolecules*, **37**, 1787-1792, (2004).
19. “Grain Growth and Interface Chemistry in a Polycrystalline Alumina with Y, Si, and Ca Impurities,” Mehmet A. Gulgun, Rowland. M. Cannon, Raisa Voytovych, and Manfred Rühle, to be submitted to *J. Am. Cer. Soc.*, (2005)
20. “Ca-doped Alumina II: Interface Structure,” A. Altay, M. A. Gulgun, R. M. Cannon, and C. B. Carter, in preparation (2005).
21. “X-Ray Single Phase LSGM at 1350C”, Cinar Oncel, Berkem Ozkaya, and Mehmet A. Gulgun, *J. Euro. Ceram. Soc.*, **27** (2-3): 599-604 (2007).

22. "Crystallization of  $\text{CaAl}_4\text{O}_7$  and  $\text{CaAl}_{12}\text{O}_{19}$  powders," Arzu Altay, C. Barry Carter, Ilke Arslan, and Mehmet A. Gulgun, submitted to , (2007)
23. "Structural Investigation of  $\text{CA}_2$  and  $\text{CA}_6$  by Energy-Loss Near-Edge Spectrometry and *Ab Initio* Calculations," A. Altay, C. B. Carter, P. Rulis, W.-Y. Ching, I. Arslan, and M. A. Gulgun, submitted to , (2007)
24. "Thin-Film Reactions between  $\text{CaAl}_4\text{O}_7$  and (0001)-oriented  $\alpha\text{-Al}_2\text{O}_3$ ", A. Altay, C. B. Carter and M. A. Gülgün submitted to , (2007)

#### Conference Proceedings (selected)

25. "Preparation and Hydration Kinetics of Pure  $\text{CaAl}_2\text{O}_4$ ," M. A. Gülgün, I. Nettleship, O. O. Popoola, W. M. Kriven and J. F. Young. In Advanced Cementitious Systems: Mechanisms and Properties, edited by F. P. Glasser, P. L. Pratt, T. O. Mason, J. F. Young and G. J. McCarthy. Published by Materials Research Society, Pittsburgh, Vol. **245**, 199-204 (1992).
26. Chemically Bonded Ceramics as an Alternative to High Temperature Composite Processing," M. A. Gülgün, B. R. Johnson and W. M. Kriven. In Better Ceramics Through Chemistry VI, edited by A. K. Cheetham, C. J. Brinker, M. L. Mecartney and C Sanchez. Publ. by Materials Research Society, Pittsburgh, Vol. **346**, 511-516 (1994).
27. "Characterization of Macro Defect Free Processing in a Banbury Type Mixer," M. A. Gülgün and W. M. Kriven, pp. 650-651 in Proceedings of the Fifty-second Annual Meeting of Microscopy Society of America (New Orleans, July-August 1994), edited by G. W. Bailey and A. J. Garratt-Reed, San Francisco Press, San Francisco, CA, 1994.
28. "A Simple Solution-Polymerization Route for Oxide Powder Synthesis," M. A. Gülgün and W. M. Kriven, pp.57-66, in Science, Technology and Commercialization of Powder Synthesis and Shape Forming Processes", in Ceramic Transactions Vol. **62**. (Cincinnati, OH, April, 1995). Edited by J. J. Kingsley, C. H. Schilling, and J. H. Adair. American Ceramic Society, Westerville, Ohio, 1996.
29. "Chemically Bonded Ceramic Matrix Composites: Densification and Conversion to Diffusion Bonding," B. R. Johnson, M. A. Gülgün and W. M. Kriven, in Ceramic Matrix Composites-Advanced High Temperature Structural Materials, edited by R. A. Lowdern, J. R. Hellmann, M. K. Ferber, S. G. DiPietro, and K. K. Chawla, Published by Materials Research Society, Pittsburgh, Vol. **365**, 67-72 (1995).
30. "Chemically Bonded Ceramic Processing of Mono-Calcium Aluminate" by B. R. Johnson, M. A. Gülgün, and W. M. Kriven, pp. 313-320 in Science, Technology, and Commercialization of Powder Synthesis and Shape Forming Processes, Ceramic Transactions, Vol. **62**. (Cincinnati, OH, April, 1995). Edited by J. J. Kingsley, C. H. Schilling, and J. H. Adair. American Ceramic Society, Westerville, Ohio, 1996.
31. "Microstructure and Microchemistry of Y-doped  $\alpha\text{-Al}_2\text{O}_3$ " M. A. Gülgün, M. L. Mulvihill, V. Putlayev, and M. Rühle, Microscopy Microanalysis **4** (Supp.2) Proceedings, pp. 546-547, Eds : Bailey, G. W.; Alexander, K. B.; Jerome, W. G.; Bond, M. G., and McCarthy, J. J., Springer, New York, NY, 1998.

32. „Yttrium-Segregated Grain Boundaries in  $\alpha$  -Al<sub>2</sub>O<sub>3</sub>: An EELS Study,“ M. A. Gülgün, W-Y. Ching, and M. Rühle, pp. 289-96 in *Materials Sci. Forum Vols. 294-296 Intergranular and Interphase Boundaries in Materials*, edited by P. Lejcek and V. Paidar, Trans Tech Publ., Enfield, NH, 1999,
33. „Microstructure and Microchemistry of Y-Doped  $\alpha$  - Al<sub>2</sub>O<sub>3</sub>,“ Mehmet A. Gülgün, Maureen L. Mulvihill, Valery Putlayev, and Manfred Rühle, pp. 345-349, in *Turk. Ser. Der. Y. Vol. 20*, Proc. Ceramic Congress, ed. S. Turan, F Kara, and E. Putun, Turk. Cer. Soc. Publ., Eskisehir, Turkey, (1998).
34. „An ELNES Study of Yttrium-Segregated Grain Boundaries in Alpha Alumina,“ Mehmet A. Gülgün, Wai-Yim Ching, and Manfred Rühle, pp. 351-356, in *Turk. Ser. Der. Y. Vol. 20*, Proc. Ceramic Congress, ed. S. Turan, F. Kara, and E. Putun, Turk. Cer. Soc. Publ., Eskisehir, Turkey, (1998).
35. „Orientation Imaging Microscopy of Alpha Alumina,“ Maureen L. Mulvihill, Mehmet A. Gülgün, Ewald Bischoff, and Manfred Rühle, pp. 357-362, in *Turk. Ser. Der. Y. Vol. 20*, Proc. Ceramic Congress, ed. S. Turan, F Kara, and E. Putun, Turk. Cer. Soc. Publ., Eskisehir, Turkey, (1998).
36. „Yttrium in Polycrystalline  $\alpha$ -Alumina,“ Mehmet A. Gülgün and Manfred Rühle, pp 793-800 in *Key Engineering Materials Vols. 171-174*, Ed. by T. Sakuma and K. Yagi, Trans Tech Publ., Enfield, NH, 2000.
37. „Microstructural Development in  $\alpha$  -Al<sub>2</sub>O<sub>3</sub>“, M. A. Gülgün, R. Voitovych, E. Bischoff, R. M. Cannon, and M. Rühle, in *Grain Boundary Engineering in Ceramics*, Ceramic Transactions, Vol **118**, 115-125, (2000).
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39. “Microwave Assisted Processing of Ceramics,” O. Ertörer, E. Fakioglu, I. Sirer, Ç. Öncel and M. A. Gülgün, *Key Engineering Materials Vols. 264-268*, pp. 765-768, (2004)
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41. “Calcium in Alpha-Alumina: The myth and Some EM Observations,” A. Altay and M. A. Gülgün, *Key Engineering Materials Vols. 264-268*, pp. 219-224, (2004)
42. "Chemical Synthesis of LSGM Powders for Solid Oxide Fuel Cell (SOFC) Electrolyte" , Cinar Oncel and Mehmet A. Gulgun in *Ceramic Transactions*, edited by Arumugam Manthiram, Prashant N. Kumta, S. K. Sundaram, and Siu-Wai Chan, vol. 161, 61-68 (2004)
43. “Shifting Through Phase Fields: CaAl<sub>4</sub>O<sub>7</sub> on Sapphire”, A. Altay, M. A. Gülgün, and C. B. Carter, *Microscopy and Microanalysis*, Volume 11, (suppl 2), 2005, 1796CD. Presidential Student award.
44. “Structural Investigations of CA and CA<sub>2</sub> by Energy-Loss Near-Edge Spectrometry and ab initio Calculations,” Altay, A., Rulis, P., Ching, W.-Y., Arslan, I. Gulgun, M.A. and Carter, C.B., *Proceedings of the 16th International Microscopy Congress, IMC16*, edited by Hideki Ichinose and Takahisa Sasaki, Sapporo, Japan, 2006, 837

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46. "Electron Loss Near-Edge Structure Analysis of Precipitates in Yttria-doped Alumina", S. Sturm, M. A. Gulgun, R. M. Cannon, and M. Ruhle, Proceedings of the 16th International Microscopy Congress, IMC16, edited by Hideki Ichinose and Takahisa Sasaki, Sapporo, Japan, 2006, 1414.
47. "Chemical Synthesis of Mixed Oxide Powders for Solid Oxide Fuel Cell (SOFC) Electrolyte and Electrodes," Çınar Öncel and Mehmet Ali Gülgün in *Assessment of Hydrogen Energy for Sustainable Development*, Proceedings of the NATO Advanced Research Workshop on Assessment of Hydrogen Energy for Sustainable Development: Energy & Environmental Security, Istanbul, Turkey, 7-10 August 2006, Sheffield, John W.; Sheffield, Çigdem (Eds.), **VIII**, pages 147 -159, 2007, ISBN: 978-1-4020-6440-1