

T. David Burleigh, PhD & PE

PATENTS & PUBLICATIONS

PATENTS

- T.D. Burleigh, T.C. Dotson, K.T. Dotson, "Method of Anodizing Steel," (filed on January 17, 2007, U.S. application number 11/624,137.) Publication number US-2008-0169200-A1 on 07/17/2008.
- T.C. Bedard, T.D. Burleigh, and J. Kilmer, "Quaternary Ammonium Salts as a Conversion Coating or Coating Enhancement," U.S. Patent Application US 2006/0151071 A1 (Jul 13, 2006).
- T.C. Bedard, T.D. Burleigh, L.K. Hall, and J. Kilmer, "Quaternary Ammonium Salts as a Conversion Coating or as Anticorrosive Additive in Paints," International Application Published under the Patent Cooperation Treaty, (15 June 2006), International Publ. No. WO 2006/061230 A1.
- R. Keller, T.D. Burleigh, and D.M. Hydock, "Electrochemically Assisted Paint Removal from a Metal Substrate," U.S. Patent No. 5,507,926, (April 16, 1996).
- G.P. Tarcy, P. Foster, R.K. Wyss, T.D. Burleigh, "Method for Making a Light Metal-Rare Earth Metal Alloy," U.S. Patent No. 5,238,646 (August 24, 1993).
- T.D. Burleigh, R.K. Wyss, "Dual Phase Magnesium Based Alloy having Improved Properties," U.S. Patent No. 5,059,390 (October 22, 1991).

RESEARCH PAPERS IN REFEREED JOURNALS

- N. Fredj and T.D. Burleigh, "Transpassive Dissolution of Copper, and Rapid Formation of Brilliant Colored Copper Oxide Films," *Journal of the Electrochemical Society* (2011), 58, 4, C104-C110.
- S.A. Shabalovskaya, G.C. Rondelli, A.L. Undisz, J.W. Anderegg, T.D. Burleigh, M.E. Rettenmayr, "The electrochemical characteristics of native Nitinol surfaces," *Biomaterials* (2009), 30, 3662-3671.
- T.D. Burleigh, P. Schmuki and S. Virtanen, "Properties of the Nanoporous Anodic Oxide Electrochemically Grown on Steel in Hot 50% NaOH." *Journal of the Electrochemical Society*, (Jan 2009), 156, 1, C45-C53.
- T.D. Burleigh, T.C. Dotson, K.T. Dotson, S.J. Gabay, T. Sloan, S.G. Ferrell, "Anodizing Steel in KOH and NaOH Solutions," *Journal of the Electrochemical Society* (Oct. 2007), 154, 10, 579-586.

- E.A. Thompson and T.D. Burleigh, "Accelerated Corrosion of Zinc Alloys Exposed to Ultraviolet Light," Corrosion Engineering, Science and Technology (2007), 42, 3, p. 237-241.
- T.D. Burleigh and P.A. Fuierer, "Tuning Forks for Vibrant Teaching," Journal of Metals (2005), 57, 11, 26-27 <<http://www.tms.org/pubs/journals/JOM/0511/Burleigh-0511.html>>
- T.D. Burleigh, C. Ruhe, J. Forsyth, "Photo-Corrosion of Different Metals during Long-Term Exposure," Corrosion (2003), 59, 9, 774-779. See also Corrosioneering, http://www.corrosionsource.com/corrosioneering/journal/Jul02_Burleigh/Jul02_Burleigh_1.htm through ...Burleigh_5.htm
- T.D. Burleigh, C. Shi, S. Kilic, S. Kovacic, T. Thompson, and R.M. Enick "Self-Assembled Monolayers of Perfluoroalkyl Amideethanethiols, Fluoroalkylthiols, and Alkylthiols for the Prevention of Silver Tarnish," Corrosion (2002), 58, 1, 49-56.
- T.D. Burleigh, Y. Gu, G. Donahey, M. Vida, D.H. Waldeck, "Tarnish Protection of Silver using a Hexadecanethiol Self-Assembled Monolayer and Descriptions of Accelerated Tarnish Tests," Corrosion (2001), 57, 12, 1066-1074.
- J.R. Birch and T.D. Burleigh, "Oxides Formed on Titanium by Polishing, Etching, Anodizing, or Thermal Oxidizing," Corrosion (2000), 56, 12, 1233-1241.
- T.D. Burleigh and D.H. Waldeck, "Effect of Alloying on the Resistance of Cu-10% Ni Alloys to Seawater Impingement," Corrosion (1999), 55, 8, 800-804.
- A. Kuznetsova, T.D. Burleigh, V. Zhukov, J. Blachere, J.T. Yates Jr., "Electrochemical Evaluation of a New Type of Corrosion Passivation Layer: Artificially Produced Al₂O₃ Films on Al," Langmuir (1998), 14, 9, 2502-2507.
- T.D. Burleigh, A. Paris, K.H. Chan, M. Okuma and H. Katayama, "Technical Note: Photoelectrochemical Study of Inorganic Inhibitor Films Formed on Mild Steel in Aerated Municipal Water," Corrosion (1998), 54, 3, 237-240.
- F.S. Bovard, T.D. Burleigh, A.T. Smith, "Electrochemical Impedance Spectroscopy of Electrocoated Aluminum Food Cans," Electrochimica Acta (1995), 40, 2, 201-207.
- T.D. Burleigh, E. Ludwiczak, and R.A. Petri, "Intergranular Corrosion of an Al-Mg-Si-Cu Alloy," Corrosion (1995), 51, 1, 50-55.
- T.D. Burleigh, R.C. Rennick, and F.S. Bovard, "Corrosion Potentials for Aluminum Alloys measured by ASTM G69," Corrosion (1993), 49, 8, 683-685.
- T.D. Burleigh and A.T. Smith, "A Simple Impedance Spectra Method to Measure the Thickness of Nonporous Anodic Oxides on Aluminum," J. Electrochemical Society (1991), 138, 8, L34-35.
- T.D. Burleigh, "Photocurrents on Passive and Active-Passive Metals," Corrosion Science (1990), 31, 745-750.

T.D. Burleigh, "Anodic Photocurrents and Corrosion Currents on Passive and Active-Passive Metals," Corrosion (1989), 45, 6, 464-471.

T.D. Burleigh and H. Gerischer, "Photoelectrochemical Study of Oxide Layers on Tin in 1N KOH," J. Electrochemical Society (1988), 135, 12, 2938-2942.

T.D. Burleigh and R.M. Latanision, "The Effect of Phosphorus on the Corrosion of Glassy Copper-Zirconium Alloys," Corrosion (1987), 43, 8, 471-475.

T.D. Burleigh and R.M. Latanision, "The Use of Photocurrents to Characterize the Anodic Films on Ti, Zr, Cu and 304 Stainless Steel," J. Electrochemical Society (1987), 134, 1, 135-138.

T.D. Burleigh, S. Wagner, and T.F. Cizek, "Ellipsometry of Randomly Rough Oxidized Silicon Surfaces," Solar Cells (1984), 13, 2, 179-183.

T.D. Burleigh and T.W. Eagar, "Measurement of the Force Exerted by a Welding Arc," Metallurgical Transactions A (1983), 14A, 1223-1224.

BOOK CHAPTERS AND REVIEW ARTICLES

T.D. Burleigh, "Chapter 11: Corrosion of Aluminum and its Alloys," in the Handbook of Aluminum, Vol. 2, Alloy Production and Materials Manufacturing, G.E. Totten and D.S. MacKenzie, editors, Marcel Dekker, Inc. (2003), pp. 421-463.

R. Keller, D.M. Hydock, and T.D. Burleigh, "Electrochemically Assisted Paint Removal," CHEMTECH (Apr. 1996), 26, 4, 36-38.

T.D. Burleigh, "The Postulated Mechanisms for Stress Corrosion Cracking of Aluminum Alloys — A Review of the Literature 1980-1989," Corrosion (1991), 47, 2, 89-98.

SELF-PUBLISHED BOOKS

G. Egert and T.D. Burleigh, "MATE 202 Lab – Introduction to Materials Engineering Laboratory Manual," Materials & Metallurgical Engineering Dept., New Mexico Tech, Socorro, NM, (2010), 113 pages.

T.D. Burleigh, "Soccer Myths & Strategies," Socorro, NM (2010), 28 pages.

COMPLETE RESEARCH PAPERS IN CONFERENCE PROCEEDINGS.

T.C. Bedard, T.D. Burleigh, J. Kimler, "Formulated Didecyl Dimethyl Ammonium Bicarbonate/Carbonate (DDABC), a Multi-Metal Corrosion Inhibitor with Relevance to

Commercial Surface Preparation and Coatings Technology," Proceedings of the International Coatings Exposition (ICE), (Nov. 1-3, 2006), New Orleans, LA..

- M.C. Romanes, K.A. Donovan, and T.D. Burleigh, "Relation of Photocurrents to Corrosion Rates in Pure Aluminum with Various Oxides," in *Passivation of Metals and Semiconductors, and Properties of Thin Oxide Layers*, (9th International Symposium on Passivity, Paris), P. Marcus and V. Maurice, editors, Elsevier B.V., Amsterdam, (2006) p. 331-336.
- R. Yuan and T.D. Burleigh, "The Effect of Sample Shape on ECAP by Simulation," *Materials Science & Technology 2004*, Vol. II, AIST/TMS Proceedings, (Sept. 26-29, 2004, New Orleans, LA), p. 431-434.
- R. Keller, D.M. Hydock, and T.D. Burleigh, "Electrochemically Induced Paint Removal - An Environmentally Friendly Approach to Remove Lead-Containing Coatings from Steel," in *Energy and Electrochemical Processing for a Cleaner Environment*, Proceedings of the Joint International Meeting of the Electrochemical Society and the International Society of Electrochemistry, Paris, France (Sept. 1997).
- R. Keller, D. Hydock, and T.D. Burleigh, "The Electrostrip Process," SSPC 96, Protective Coatings, International Conference and Exhibition, Charlotte, NC, (Nov. 17-21, 1996).
- T.D. Burleigh, "Photoelectrochemistry for Non-Destructive, In-situ Characterization of Corroding Metals," (Materials Week '95, Cleveland, OH) New Techniques for Characterizing Corrosion and Stress Corrosion, ed. R.H. Jones and D.R. Baer, TMS, Warrendale, PA, (1996) 267-273.
- T.D. Burleigh, "Photoelectrochemical Analysis of the Hydroxide Surface Films on Aluminum and its Alloys," (Seventh International Symposium on Passivity, Clausthal, Germany, Aug. 22-26, 1994) Materials Science Forum, Vols. 185-188 (1995) 447-456.
- T.D. Burleigh, E.H. Gillespie, S.C. Biondich, "Blowout of Aluminum Alloy 5182 Can Ends Caused by Transgranular Stress Corrosion Cracking," Aluminum Alloys for Packaging, eds. J.G. Morris, H.D. Merchant, E.J. Westerman, and P.L. Morris, The Minerals, Metals, and Materials Society, (1993) pp. 323-332.
- T.D. Burleigh, "Microscopic Investigation of the Intergranular Corrosion of Alloy 6013-T6," Aluminum Alloys, Their Physical and Mechanical Properties (ICAA3), Vol. II, editors L. Arnberg, O. Lohne, E. Nes, N. Ryum, The Norwegian Institute of Technology, Dept. of Metallurgy, and SINTEF Metallurgy, Trondheim, Norway, (1992) pp. 435-440.
- G.E. Nordmark, J.M. Miller, and T.D. Burleigh, "Environmental Durability of Joints for Aluminum Automotive Frames," CORROSION/91, March, 1991, Cincinnati, OH, Paper #566.
- T.D. Burleigh, "The Saltwater Corrosion of Commercial Purity Magnesium," Magnesium-The Performance Material, (Proceedings of the 46th Annual World Magnesium Conference), Dearborn, Michigan, (1989) pp. 66-71.

- T.D. Burleigh, E.R.C. Johns, R.M. Latanision, "The Effect of Phosphorus on the Corrosion Resistance of Rapidly Quenched Alloys," Rapidly Quenched Metals (RQ5), eds. S. Steeb and H. Warlimont, North-Holland (1985), pp. 1457-1464.
- T.D. Burleigh and R.M. Latanision, "The Effect of Phosphorus on the Corrosion and Photocorrosion of Glassy Copper-Zirconium Alloys," Proceedings of the Ninth International Congress on Metallic Corrosion, Vol. 2, National Research Council of Canada, Toronto, Ontario, Canada, (1984), pp. 645-648.
- T.D. Burleigh and R.M. Latanision, "The Effect of Phosphorous on the Corrosion Resistance of Glassy Copper-Zirconium Alloys," Rapidly Solidified Metastable Materials, eds. B.H. Kear and B. C. Giesson, North-Holland (1984), pp. 227-231.
- T.D. Burleigh and R.M. Latanision, "The Effect of Phosphorus on the Corrosion Resistance of Amorphous Copper-Zirconium Alloys," Passivity of Metals and Semiconductors, editor M. Froment, Elsevier Sci. Pub. (1983), pp. 321-326.

ABSTRACTS AND EXTENDED ABSTRACTS IN CONFERENCE PROCEEDINGS.

- T.D. Burleigh, J. Kimler, T.C. Bedard, CORROSION NACEExpo 2006, Research in Progress, San Diego, CA (March 2006).
- E.A. Thompson and T.D. Burleigh, "Photo-Corrosion of Zinc Alloys Exposed to Ultraviolet Light," 17th Annual Rio Grande Symposium on Advanced Materials, Albuquerque, NM, Oct-11-2005.
- M.C. Romanes, K.A. Donovan, and T.D. Burleigh, "Relation of Photocurrents to Corrosion Rates in Pure Aluminum with Various Oxides," Passivity-9, The 9th International Symposium on the Passivation of Metals and Semiconductors and the Properties of the Thin Oxide Films, Paris France, June 27 - July 1, 2005.
- T. David Burleigh, Joe Kimler, and Thomas Bedard, "Formulated Didecel Dimethyl Ammonium Bicarbonate/Carbonate (DDABC); a Multi-metal Corrosion Inhibitor,": Society of Tribologists and Lubrication Engineers (STLE) 60th Annual Meeting & Exhibition, Las Vegas, NV, May 15-19, 2005.
- M.C. Romanes, K.A. Donovan, and T.D. Burleigh, "A look into the origin of photocurrents in aluminum oxides and their relation to corrosion resistance," Abstract #233, 207th Meeting of the Electrochemical Society, Quebec, Canada, May 16-20, 2005.
- M.C. Romanes, K.A. Donovan, and T.D. Burleigh, "Use of Photocurrent Spectroscopy in Predicting the Pitting Tendency of Thermal and Plasma Oxides on Aluminum," 16th Annual Rio Grande Symposium on Advanced Materials, Albuquerque, NM, Oct-25-2004.

- R. Yuan and T.D. Burleigh, "DEFORM 3D Modeling of ECAP and Twist ECAP," 16th Annual Rio Grande Symposium on Advanced Materials, Albuquerque, NM, Oct-25-2004..
- M.C. Romanes, K.A. Donovan, and T.D. Burleigh, "Differentiation of Thermal and Plasma Oxides formed on Aluminum by using Photocurrent Spectroscopy," 15th Annual Rio Grande Symposium on Advanced Materials, Albuquerque, NM, Oct-27-2003.
- R. Yuan and T.D. Burleigh, "Computer Modeling of Equal Channel Angular Pressing (ECAP)- A Technique for Developing Ultra-fine-grain Metals," 15th Annual Rio Grande Symposium on Advanced Materials, Albuquerque, NM, Oct-27-2003.
- L. Zeeb, M. McCleary, and T. D. Burleigh, "Anodizing Steel," 14th Annual Rio Grande Symposium, Albuquerque, NM, Oct-21-2002.
- J. Forsyth, C. Ruhe, E. Thompson, and T.D. Burleigh, "Photo-Induced Corrosion of Several Different Metals," Research in Progress Symposium Extended Abstracts, CORROSION NACEExpo 2002, Denver, CO, April 7-11, 2002, p. 38-39.
- R. Keller, D.M. Hydock, and T.D. Burleigh, "Development of the Electrostrip Process," Emerging Technologies in Hazardous Waster Management VIII, 1996 Extended Abstracts for the Special Symposium, Birmingham Alabama, Industrial & Engineering Chemistry Division, American Chemical Society, Sept. 9-11, 1996, p.755-757.
- R. Keller, D.M. Hydock, and T.D. Burleigh, "Electrochemically Assisted Paint Removal," 1995 Extended Abstracts for the Industrial & Engineering Chemistry Division, American Chemical Society, Sept. 17-20, 1995.
- T.D. Burleigh, A. Paris, M. Okuma, and H. Katayama, "Photoelectrochemical Analysis of The Barrier Films Formed on Inhibited Steel in Aerated Tap Water," Research in Progress Symposium, CORROSION/96, Denver, CO, March 1996.
- C. Mevellec, T.D. Burleigh, A.S. Shanbhag, "Corrosion in Modular Femoral Hip Prostheses: A Study of 22 Retrieved Implants," (extended abstract in IEEE96) 15th Annual Southern Biomedical Engineering Conf., Dayton, OH, (Mar-1996), p. 3-4.
- M.C. Musolino, F.S. Pettit, T.D. Burleigh, H.E. Rubash, A.S. Shanbhag, "Analysis of Corrosion in Stainless Steel Total Hip Prostheses," (extended abstract in IEEE96) 15th Annual Southern Biomedical Engineering Conf., Dayton, OH, (Mar-1996), p. 5-6.
- R. Keller, D.M. Hydock, and T.D. Burleigh, "Electrochemically Assisted Paint Removal," Emerging Technologies in Hazardous Waste Management VII, 1995 Extended Abstracts for the Special Symposium, Atlanta, Georgia, Industrial & Engineering Chemistry Division, American Chemical Society, Sept. 17-29, 1995, p. 135-136.
- Y.H. Ismail, T.D. Burleigh, J.R. Blachere, "Stress Corrosion and Failure of Implant Abutment Screws," (1995 IADR - Singapore, June 1995), Journal of Dental Research, 74, 405, Sp. Iss. S.I. 1995.

T.D. Burleigh, A.S. Shanbhag, J.M. Birch, M.C. Musolino, F.S. Pettit, "Corrosion in Stainless Steel Hip Prostheses: A Study of Two Implants Retrieved after a Long Service Life," The 21th Annual Meeting of the SOCIETY FOR BIOMATERIALS, March 18-22, 1995, San Francisco, CA.

T.D. Burleigh and R.M. Latanision, "A Semiconductor/Electrolyte Model of the Anodic Film," Extended Abstracts, Vol. 85-1, of the Electrochemical Society Spring Meeting, Toronto, Ontario, Canada, (1985) pp. 41-42.

T.D. Burleigh and R.M. Latanision, "The Use of Photocurrents to Characterize Anodic Films," Extended Abstracts, Vol. 85-1 of the Electrochemical Society Spring Meeting, Toronto, Ontario, Canada, (1985), pp. 37-38.
