

Exponent®
Engineering & Scientific Consulting

Yash Bhargava, Ph.D., P.E.

Principal Engineer | Metallurgical and Corrosion Engineering
Menlo Park
+1-650-688-6749 | ybhargava@exponent.com

Professional Profile

Dr. Bhargava specializes in corrosion science, with an emphasis on corrosion monitoring, testing, evaluation, and protection. He has expertise with the application of electrochemical and microscopy (optical, SEM, TEM) techniques in various areas, particularly the oxidation behavior of 3d transition metals and their passive films.

Dr. Bhargava also has extensive experience in general and localized corrosion, galvanic corrosion, atmospheric corrosion, anodization processes, alloying effects on corrosion performance, and evaluating the corrosion behavior of materials in high temperature, high pressure aqueous environments. He has also developed a strong background in material science, semiconductors, photovoltaics, nanotechnology, and materials characterization.

Dr. Bhargava has investigated corrosion issues relating to medical devices, pipelines, boilers, architectural materials, electronics, and automotive components, as well as coating failures. He has performed corrosion performance evaluations on many different materials used in the medical device industry including stainless steels, titanium, nitinol, and cobalt-chromium alloys using electrochemical and metallographic techniques.

Prior to joining Exponent, Dr. Bhargava completed graduate studies at University of California, Berkeley, in the department of Materials Science and Engineering, where his research focused on the synthesis, characterization, and application of metal oxide nanostructures formed by an electrochemical route. These nanostructures were applied and tested as electrodes in both lithium batteries and nickel metal-hydride batteries. Dr. Bhargava also constructed simulated high temperature, high pressure systems for testing the corrosion behavior of Ni-alloys used in pressurized water reactors during his graduate work. While at the University of California, Dr. Bhargava served as the graduate student instructor for the upper division corrosion class for four years, as well as the introductory materials science course for one year.

Academic Credentials & Professional Honors

Ph.D., Materials Science and Engineering, University of California, Berkeley, 2008

M.S., Materials Science and Engineering, University of California, Berkeley, 2005

B.S., Materials Science and Engineering, University of California, Berkeley, 2002

B.S., Chemical Engineering, University of California, Berkeley, 2002

Corrosion Fund Scholarship, 2007 and 2008

Outstanding Graduate Student Instructor Award, 2007

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Edwin Letts Oliver Scholarship for Mining and Metallurgy, 2003

Licenses and Certifications

Professional Engineer Metallurgical, California, #1971

Professional Affiliations

NACE International (member)

American Gas Association - Transmission Integrity Management Committee

Languages

Hindi

Publications

Davis, B, Hudgins, A, Bhargava, Y, Patrick, B, Myca, M, Fatigue Threat to Natural Gas Pipelines: An Analysis Approach, Proceedings of the ASME 2022 14th International Pipeline Conference, IPC 2022, September 26-30, Calgary Alberta, Canada, IPC2022-87283.

Hudgins A, Myca K, Davis B, Bhargava Y, A Systematic Approach to Pipeline Fatigue Analysis, American Gas Association (AGA) Transmission Integrity Mega Rule Implementation Webinar, October 15, 2020.

Nguyen QAS, Bhargava YV, Radmilovic VR, Devine TM. Structural study of electrochemically synthesized TiO2 nanotubes via cross-sectional and high resolution TEM. Electrochimica Acta 2009; 54 (18):4340-4344.

Bhargava YV, Nguyen QAS, Devine TM. Initiation of organized nanopore/nanotube arrays in anodized titanium oxide II: nanopore size and spacing. Journal of the Electrochemical Society 2009; 156(3):E62-E68.

Nguyen QAS, Bhargava YV, Devine TM. Initiation of organized nanopore/nanotube arrays in anodized titanium oxide I: Criterion for initiation. Journal of the Electrochemical Society 2009; 156(3):E55-E61.

Bhargava YV. Novel electrochemical synthesis and characterization of nickel-rich oxide nanowires. Ph.D. Dissertation, University of California, Berkeley, CA, 2008.

Nguyen QA, Bhargava YV, Devine TM. Titania nanotube formation in chloride and bromide containing electrolytes. Electrochemistry Communications 2008; 10:471-475.

Cohen-Hyams T, Bhargava YV, Thorne SA, Wilcox JD, Devine TM. Synthesis of NiO nanowires for Li batteries. ECS Transactions, Vol. 11, Washington D.C., February 2008.

Thorne S, Bhargava Y, Radmilovic V, Devine T. Synthesis and properties of nickel-rich oxide nanowires. Proceedings, Materials Science and Technology Conference, 2006.

Bhargava YV, Thorne SA, Mintz TS, Hyams TC, Radmilovic V, Suzuki Y, Devine TM. Synthesis of magnetic self-assembled nickel-rich oxide nanowires using a novel electrochemical process. In: Magnetic Nanoparticles and Nanowires. Kumar D, Kurihara L, Boyd IW, Duscher G, Harris V (eds), S7.4.1.

Mintz TS, Bhargava YV, Thorne SA, Chopdekar R, Radmilovic V, Suzuki Y, Devine TM. Electrochemical

Synthesis of Functionalized Nickel Oxide Nanowires. Electrochemical and Solid-State Letters 2005; 8(9):D26-D30.

Thorne SA, Bhargava YV, Mintz TS, Radmilovic V, Suzuki Y, Devine TM. Novel method for the electrochemical synthesis of nickel-rich oxide nanowires. Proceedings, NSTI Nanotechnology Conference and Trade Show, Vol. 2, p. 630-633, 2005.

Presentations

Marquardt, A, Hudgins A, Sakamoto, M, Bhargava, Y, Understanding Corrosion of Transmission Overhead Structures for Improved Lifetime Prediction and Risk Modeling. CEATI International, CEATI 2021 Transmission & Distribution Conference, November, 2021.

Hudgins A, Bhargava, Brenk G, Differentiating Between Low and High Frequency ERW Pipe. American Gas Association, Transmission Integrity Management Committee Meetings, Orlando FL, October 4, 2021.

Bhargava Y, Hudgins A, Patrick B, Determining Growth Rates for Assessment of Stress Corrosion Cracking on Pipelines. American Gas Association Fall 2021 Operations Conference, Orlando FL, October 6, 2021.

Hudgins A, Myca K, Davis B, Bhargava Y, Mega Rule Deep Dive: Engineering Analysis, Crack-like features, Corrosion + Seismicity, Western Energy Institute (WEI) Transmission Integrity Webinar, July 13, 2021.

Bhargava YV, Thorne SA, Nguyen QAS, Cohen-Hyams T, Devine TM. Novel electrochemical synthesis of Ni-rich oxide nanowires for battery applications. The 214th Meeting of the Electrochemical Society, Honolulu, HI, 2008.

Nguyen QS, Bhargava YV, Devine T. Structural study of electrochemically synthesized TiO2 nanotubes via cross-sectional TEM and micro-XRD. The 214th Meeting of the Electrochemical Society, Honolulu, HI, 2008.

Nguyen QA, Bhargava YV, Thorne SA, Cohen-Hyams T, Devine TM. Surface enhanced Raman spectroscopy and cyclic voltammetry studies of Ni-rich oxide nanowires. Materials Research Society Spring Meeting, 2008.

Cohen-Hyams T, Bhargava YV, Thorne SA, Wilcox JD, Devine TM. Synthesis of nickel oxide nanowires from Li batteries. The 212th Meeting of the Electrochemical Society, Washington, D.C., 2007.

Bhargava YV. New approach to the synthesis of nickel-rich oxide nanowires. Electrochemical Society, San Francisco Section Meeting, San Francisco, CA, April 2007 (invited talk).

Devine TM, Bhargava YV, Thorne SA. Synthesis and properties of nickel-rich oxide nanowires. Materials Science and Technology Conference, 2006.

Bhargava YV, Thorne SA, Mintz T, Radmilovic V, Devine TM. Novel electrochemical synthesis of nickel oxide nanowires. International Congress of Nanotechnology Meeting, 2005.

Bhargava Y, Thorne SA, Mintz TS, Cohen-Hyams T, Suzuki Y, Radmilovic V, Devine TM. Structure and properties of electrochemically synthesized, self-assembled, functionalized nickel oxide nanowires. The 208th Meeting of the Electrochemical Society, Los Angeles, 2005.

Bhargava YV. Synthesis of magnetic self-assembled nickel-rich oxide nanowires using a novel electrochemical process. Materials Research Society Spring Meeting, 2005.

Thorne S, Bhargava Y, Mintz T, Radmilovic V, Suzuki Y, Devine T. Novel electrochemical synthesis technique for self-assembled nickel-oxide nanowires. American Chemical Society Spring Meeting, 2005.

Hudgins A, Bhargava Y. The Implications of the proposed rule changes for corrosion control practices: what it means to operators and contractors. API Inspection Summit, February 2, 2017.

Hudgins A, Bhargava Y. Susceptibility of natural gas pipelines to stress corrosion cracking. American Gas Association Spring 2017 Operators Meeting, Orlando FL, May 4, 2017.

Bhargava Y, Hudgins A. Direct cause analysis - root cause analysis for external corrosion. American Gas Association Spring 2018 Corrosion Control Committee Meeting, June 26, 2018.