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Engineering & Scientific Consulting

Ying Wang, Ph.D.

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Professional Profile

Dr. Ying Wang is a construction materials consultant specializing in cements, supplementary cementitious materials (SCMs) and concrete including durability, failure analysis, and performance evaluation in a variety of applications. She has supported infrastructure owners, DOTs, cement and concrete manufacturers, and standards bodies by assessing durability risks, identifying root causes of construction material degradation, and improving long-term service life.

Dr. Ying Wang specializes in material characterization, durability assessment, and failure analysis of cement and concrete materials used in infrastructure and construction applications, with particular emphasis on traditional and novel cementitious systems. Her work integrates cement and concrete materials science, laboratory testing, and microstructural and physicochemical characterization to assess performance and degradation potential, identify root causes of durability-related issues, and support optimization of materials for long-term performance in various service conditions. Her expertise includes multi-scale physicochemical characterization and performance evaluation of cementitious materials using techniques such as XRD, XRF, SEM-EDS, FTIR, TGA, PSD, BET, and isothermal calorimetry; assessment of SCMs reactivity; and evaluation of concrete rheology, mechanical properties, and durability. Dr. Wang has developed and validated novel methods for assessing the reactivity and long-term performance of marginal and conventional SCMs, and activating existing low-reactivity materials for use as SCMs, enabling the effective use of unconventional fly ashes, pozzolans, slags, pumice, glass, and clays in concrete applications.

Since joining Exponent as a construction materials consultant, Dr. Wang has supported projects involving concrete durability performance evaluation and materials failure analysis. Her experience includes assessing durability-related performance of concrete materials using laboratory testing and analytical methods, interpreting results to identify degradation mechanisms relevant to service environments, and applying failure analysis methodologies to address material-related performance issues. Across her consulting work, Dr. Wang utilizes data analysis and interpretation to translate laboratory findings into clear, defensible guidance that supports client decision-making.

Prior to joining Exponent, Dr. Wang worked in construction materials research and development, supporting the formulation, validation, and scale-up of novel cementitious materials, including low-carbon and alternative cementitious binder systems. Her work involved durability testing, experimental design, microstructural and physicochemical characterization, and performance benchmarking of cement and concrete materials under relevant service conditions. She also supported development of strategies to improve durability, consistency, and long-term reliability, and contributed to scale-up validation efforts by linking laboratory durability data to deployment and implementation considerations.

Dr. Wang earned her Ph.D. in Civil and Architectural Engineering from the University of Miami, where her research focused on cementitious materials durability, supplementary and alternative cementitious materials, and sustainable infrastructure materials. Dr. Wang earned her B.S. and M.Eng. degrees in

Mineral Processing Engineering and has expertise in a range of mineral processing techniques, including gravity separation, magnetic separation, flotation, hydrometallurgical leaching, and microbiological methods for metal extraction. She developed approaches to reduce mine tailings through their use as concrete constituents for mine backfill. Dr. Wang has authored many peer-reviewed publications and is a member of professional organizations including the American Concrete Institute (ACI), ASTM International, RILEM, and the American Ceramic Society (ACerS).

Academic Credentials & Professional Honors

Ph.D., Civil Engineering, University of Miami, 2022

M.Eng., Mineral Process Engineering, University of Science and Technology Beijing, 2020

B.S., Mineral Process Engineering, University of Science and Technology Beijing, 2017

B.S., Business Management, University of Science and Technology Beijing, 2017

ACI Young Professional Member, 2022

Katharine and Bryant Mather Scholarship, 2021

Environmental Research and Education Foundation Scholarship, 2021

Giatec Best Paper Award, 2021

Wulkan Family American Public Transportation Foundation Endowed Scholarship, 2021

John Faber Scholarship, 2020

Prior Experience

R&D Materials Scientist, Fortera, 2023-2026

Research and Teaching Assistant, University of Miami, 2019-2022

Professional Affiliations

American Concrete Institute (ACI) - ACI 232 Fly Ash and Bottom Ash in Concrete Committee, Member

ASTM International, Member

International Union of Laboratories and Experts in Construction Materials, Systems and Structures (RILEM), Member

American Ceramic Society (ACerS), Member

Publications

Wang Y, Suraneni P. Experimental methods to determine the feasibility of steel slags as supplementary cementitious materials. Construction and Building Materials 2019; 204(1):458–467.

Wang Y, Ni W, Suraneni P. Use of ladle furnace slag and other industrial by-products to encapsulate chloride in municipal solid waste incineration fly ash. Materials 2019; 12(6):925.

Suraneni P, Hajibabaee A, Ramanathan S, Wang Y, Weiss WJ. New insights from reactivity testing of

supplementary cementitious materials. Cement and Concrete Composites 2019; 103:331–338.

Wang Y, Ni W, Zhang S, Wang Y, Li J. Research status of hydration mechanism of alumino-based cementitious system. Metal Mine 2019; 04.

Wang Y, Ni W, Zhang Y. Crystallization properties research of high alumina bauxite at low calcination temperature. Metal Mine 2019; 03.

Wang Y, Ni W, Zhang S, Li J, Suraneni P. Optimal mixture designs for heavy metal encapsulation in municipal solid waste incineration fly ash. Applied Sciences 2020; 10(19):6948.

Wang Y, Burris L, Shearer C, Hooton D, Suraneni P. Strength activity index and bulk resistivity index modifications that differentiate inert and reactive materials. Cement and Concrete Composites 2021; 124:104240.

Wang Y, Burris L, Shearer C, Hooton D, Suraneni P. Effects of unconventional fly ashes on cementitious paste properties. Cement and Concrete Composites 2022; 125:104291.

Wang Y, Acarturk BC, Burris L, Hooton RD, Shearer C, Suraneni P. Physicochemical characterization of unconventional fly ashes. Fuel 2022; 316:123318.

Wang Y, Ramanathan S, Burris L, Hooton RD, Shearer C, Suraneni P. Reactivity of unconventional fly ashes, SCMs, and fillers: Effects of sulfates, carbonates, and temperature. Advances in Civil Engineering Materials 2022; 11(2):639–657.

Wang Y, Ramanathan S, Burris L, Shearer CR, Hooton RD, Suraneni P. A rapid furnace-based gravimetry test for assessing reactivity of supplementary cementitious materials. Materials and Structures 2022; 55(193).

Wang Y, Ramanathan S, Chopperla KST, Ideker JH, Suraneni P. Estimation of non-traditional supplementary cementitious materials potential to prevent alkali-silica reaction using pozzolanic reactivity and bulk resistivity. Cement and Concrete Composites 2022; 133:104723.

Wang Y, Suraneni P. Extending fly ash and pumice usage through blending with inert basaltic fines. Materials and Structures 2023; 56(134).

Wang Y, Burris L, Shearer C, Hooton R, Suraneni P. Characterization and reactivity of size-fractionated unconventional fly ashes. Materials and Structures 2023; 56(49).

Wang Y, Suraneni P. Thermal activation of inert basaltic materials to create supplementary cementitious materials. Cement 2023; 13:100082.

Li Q, Li J, Zhang S, Huang X, Wang X, Wang Y, Ni W. Research progress of low-carbon cementitious materials based on synergistic industrial wastes. Energies 2023; 16(5):2376.

Hargis C, Chen I, Wang Y, Maraghechi H, Gilliam R, Monteiro P. Microstructure development of calcium carbonate cement through polymorphic transformations. Cement and Concrete Composites 2024; 153:105715.

Wang F, Du H, Zheng Z, Xu D, Wang Y, Li N, Ni W, Ren C. The impact of fly ash on the properties of cementitious materials based on slag-steel slag-gypsum solid waste. Materials 2024; 17(19):4696.

Wang Y, Gonzalez J, Hargis C. Utilization of waste CO2 generated vaterite in blended cements. ACI Special Publication 2024; 362:854–870.

Presentations

Wang Y. Vaterite performance as an SCM extender and binder. Oral presentation, 14th Advances in Cement-Based Materials, Missouri University of Science and Technology, Rolla, MO, USA, 2024.

Wang Y. Estimation of supplementary cementitious materials potential to prevent alkali-silica reaction using pozzolanic reactivity and bulk resistivity. Oral presentation, ACI 2022 Conference, 2022.

Wang Y. Estimation of SCM potential to prevent ASR using SCM reactivity and bulk resistivity. Oral presentation, 12th Advances in Cement-Based Materials, University of California, Irvine, CA, USA, 2022.

Wang Y. Reactivity of unconventional fly ashes, SCMs, and fillers: effects of sulfates, carbonates, and temperature. Oral presentation, ASTM Committee Meeting, Seattle, WA, USA, 2022.

Wang Y. Reactivity of calcium aluminosilicate glasses. Oral presentation, University of Miami Research Day, Coral Gables, FL, USA, 2022.

Wang Y. Strength activity index and bulk resistivity index modifications that differentiate inert and reactive materials. Oral presentation, 11th American Ceramic Society (ACerS) Meeting, 2021.

Peer Reviews

Engineering Structures

Advances in Civil Engineering Materials

Open Geosciences

Composites Part B

International Journal of Pavement Research and Technology