



Exponent[®]
Engineering & Scientific Consulting

Sadella Santos, Ph.D.

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Professional Profile

Dr. Santos consults on a wide variety of projects related to the structure-property relationship of polymers specified for use in the construction and building materials, automotive, medical and consumer products industries. She routinely investigates technical challenges in all aspects of product development from concept through commercialization with an emphasis on failure analysis, materials characterization, chemical compatibility, and considering product end-use environment.

Trained as a polymer scientist, Dr. Santos specializes in the formulation and characterization of paints, coatings and sealants and leverages her broad knowledge of the chemical and physical behavior of polymers to design and formulate new products in the adhesives, personal care, consumer products, and construction industries.

Dr. Santos has extensive experience with a variety of material characterization techniques such as Fourier transform infrared (FTIR) spectroscopy, thermal gravimetric analysis (TGA), differential scanning calorimetry (DSC) and dynamic mechanical analysis (DMA). Additional characterization techniques that she is proficient with include scanning electron microscopy (SEM), energy-dispersive x-ray spectroscopy (EDS), ultraviolet-visible spectroscopy, electrochemical impedance spectroscopy (EIS) and scanning electrochemical microscopy (SECM). Dr. Santos has experience with various composite fabrication techniques as well as standardized mechanical test methods for polymers and composite materials.

Prior to joining Exponent, Dr. Santos doctoral research involved the development, incorporation, and creation of microencapsulated reversible healing chemistries and corrosion additives to improve the durability of epoxy-amine coatings for corrosion prevention. Her work included the development and study of solvent diffusion, plasticization, and microencapsulation reactions in self-healing coatings. She utilized fracture mechanics and electrochemical techniques to characterize self-healing ability and corrosion resistance of thermoset coatings.

Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, Drexel University, 2019

B.S., Chemical Engineering, University of Maryland, Baltimore County, 2012

Prior Experience

U.S. Army Research Laboratory, ORAU Journeyman Fellow, 2016

Undergraduate Research Intern, Brandeis University, 2011

Undergraduate Research Intern, Brown University, 2009

Languages

Tagalog

Publications

Brooke, P., Bennett-Kennett, R., Gupta, C. et al. Failure of Coatings on Wood Substrates Due to Surface Preparation and Application. *J Fail. Anal. and Preven.* (2024). <https://doi.org/10.1007/s11668-024-02090-7>

Gao, J., Chu, X., Henry, C. K., Santos, S. C., & Palmese, G. R. (2021). Highly ductile glassy epoxy systems obtained by network topology modification using partially reacted substructures. *Polymer*, 212, 123260.

Santos, Sadella C., John J. La Scala, and Giuseppe R. Palmese. "Effect of Microcapsule Content on Diels-Alder Room Temperature Self-Healing Thermosets." *Polymers* 12.12 (2020): 3064.

Santos, Sadella Cruz. Thermoreversible Diels-Alder Healable Polymeric Systems for Corrosion Prevention. Diss. Drexel University, 2019.

Ayala, Alfred, Gwendolyn F. Elphick, Ye Sul Kim, Xin Huang, Arnaldo Carreira-Rosario, Sadella C. Santos, Nicholas Shubin, Yaping Chen, Jonathan Reichner, Chun-Shiang Chung, "Sepsis Induced Potentiation of Peritoneal Macrophage Migration is mitigated by PD-1 Gene Deficiency" *Journal of Innate Immunity*, 6.3 (2014): 325-338.

Presentations

Sadella C. Santos, Giuseppe R. Palmese, "Influence of microcapsule loading on performance of self-healing thermosets", Society for the Advancement of Material and Process Engineering Conference 2018, Long Beach, CA, May 2018

Sadella C. Santos, Giuseppe R. Palmese, "Size impact of microcapsules in room temperature, self-healing thermosets", Society for the Advancement of Material and Process Engineering Conference 2017, Seattle, WA, May 2017

Sadella C. Santos, Giuseppe R. Palmese, "Corrosion prevention using reversible Diels-Alder based self-healing coatings", 252nd American Chemical Society National Meeting and Exposition, Philadelphia, PA, August 2016

Sadella C. Santos, Giuseppe R. Palmese, "Corrosion prevention using reversible Diels-Alder based self-healing coatings", Society for the Advancement of Material and Process Engineering Conference 2016, Long Beach, CA, May 2016