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Sadella Santos, Ph.D.

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Professional Profile

Dr. Santos' areas of expertise include the synthesis and characterization of polymeric materials and composites. She has specific expertise in coatings and micro-encapsulation.

Her current research interests include assessing these types of materials for use in architectural coatings, synthetic turf, piping and other construction products.

Dr. Santos performs root cause investigations involving polymeric materials and routinely uses 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.

As a graduate student at Drexel University, Dr. Santos studied 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 developed encapsulated corrosion inhibitors for use in the targeted delivery of liquid inhibitors to damaged areas in coatings. Fracture mechanics techniques and electrochemical techniques such as electrochemical impedance spectroscopy (EIS) and scanning electrochemical microscopy (SECM) were used 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

Professional Affiliations

American Chemical Society

American Institute of Chemical Engineers

Society for the Advancement of Material and Process Engineering

Languages

Tagalog

Publications

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, May2016