

Schedule

4:00 – Dinner Ticket/Membership Sales

4:30 – Technical Presentations

please turn off cell phones

6:00 – Social Hour 7:00 – Dinner

Ohio Rubber Group Spring Technical Meeting Tuesday, September 27, 2022

Hilton Garden Inn, 330-405-4488
8971 Wilcox Drive, Twinsburg, Ohio

Technical Presentations

*****Please turn off cell phones during the presentations*****



Simultaneous Determination of Additive Concentration in Rubber Using ATR-FTIR Spectroscopy

Stephen Merriman, ORG Scholarship Recipient, PhD Candidate, Polymer Engineering, The University of Akron

Using attenuated total reflection (ATR) Fourier transform infrared (FTIR) spectroscopy for direct quantitative analysis is highly desirable for many sample systems due to advantages such as rapid spectra collection and being completely nondestructive. However, formulated rubber represents a complex sample matrix for which the feasibility of direct quantitative analysis using ATR-FTIR is uncertain. The commonly used Beer-Lambert law may not be applicable, besides sample related complexities such as inhomogeneity, variable optical properties, or heavily overlapping absorption bands. In this work, we considered fully formulated vulcanized rubber with carbon black or silica as the primary filler as our system of interest. We developed a method to simultaneously quantify the concentration of three different antidegradents of similar chemical structure directly on rubber samples using ATR-FTIR spectra. Results show that absorbance follows the Beer-Lambert law well for the range of antidegradent concentrations considered. Despite this, a direct application of the Beer-Lambert law to deconvolute overlapping peaks between antidegradents proved insufficient. Through the application of partial least squares (PLS) multivariate analysis, remarkable prediction accuracy of within about 0.15 wt% error for all three antidegradents was achieved for both types of rubber formulations, even with high levels of carbon black. These results show the value this method has for quantitative analysis of additives in rubber. Our investigation highlights the potential usefulness of FTIR spectroscopy in general for rapid quantitative analysis directly on samples of interest without any prior chemical separation.



Cyber Security

Todd E. Riley, CISM, Cyber Security Manufacturing Leader, Goodyear Tire & Rubber Co.

We will discuss cyber security while at home, work and traveling that you should consider to protect your data and assets. We will review a few notorious business incidents, significant impacts experienced, the growing cyber threats we face today, and a review of some basic security considerations. Covered will be cyber regulations, portable storage device use, vulnerability management, firewalls, password strength, multiple factor authentication, email address use, privacy, reporting suspicious behaviors, email red flags, business email compromise, process controls, software installation/updates, phishing, public WIFI, bluetooth, and social media use. In summary, cyber security is everyone's responsibility. Slow down and think before you click.





2022 Fall Meeting - DINNER RESERVATIONS

Advanced Reservation - \$35.00 each **Without prior reservation - \$40.00 each**

Reserve ___ tickets (*pick up at door*) 1) Pay at Door OR 2) Payment Enclosed \$ _____ (*Cash, Check, Credit*)

Credit Card # _____ Exp. Date _____

Code _____ Billing Zip Code _____

Name _____ Company _____

E-mail reservations to mpuskas@littlern.com OR mail to Ohio Rubber Group, PO Box 341, Bath, OH 44210