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Analysis of Fiber Structure in a Concrete Matrix from EBS Coupled to Raman Spectra KEITH ANDREW, SHANE PALMQUEST, EDWARD KINTZEL, AARON CELESTIAN, GREGORY ARBUCKLE, JAHI PALMER, Western Kentucky University — Fibers at the mirco and nano scales have been added to concrete for many years to help control and design the mechanical and structural properties of the underlying material. Such specialty fibers may result in cementitious materials that are more durable, flexible, stronger, less permeable, and "crack free" than traditional concrete. Using the combined power of Electron Backscatter methods coupled to Raman Spectroscopy we examine a series of cast specimens that contain microfibers and carbon nanotube fibers, CNTs. We detail the surface morphology of regions near failure zones and analyze the failure strain rates for samples with different mixture ratios. A detailed interpretation of the underlying chemical bonding structure is added to the analysis from Raman spectroscopy applied to the samples. These results provide a greater understanding on the nature of the interfacial transition zone, ITZ, between the cement and paste and the aggregates.

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