Steven Rogak, J Material Sci Eng 2018, Volume 7
DOI: 10.4172/2169-0022-C9-115

20th International Conference on
Emerging Materials and Nanotechnology
June 25-26, 2018 | Vancouver, Canada

Steven Rogak

The University of British Columbia, Canada

Aerosol carbon nanoparticles: The connection between aggregate morphology and nano-structural features

Aerosol nanoparticles composed mainly of carbon are created unintentionally from fuel-rich non-premixed combustion; this "soot" or "black carbon" has enormous climate and health implications. "Carbon black", however, is created intentionally as a material filler or pigment, and exhibits nearly the same structure: fractal-like aggregates of nearly-spherical primary particles. Recently our group has found that the primary particles within soot aggregates from a combustion source have a wide size range (8-80 nm), but the distribution within individual aggregates is quite narrow, and generally larger aggregates have larger primary particles. This suggests that the aggregate morphology is derived from highly localized conditions within flames. Carbon aerosol particles segregated by physical characteristics (aerodynamic size or mass) have different optical properties and show different Raman spectra. This might be of interest in tuning material properties, but it is also of fundamental interest to combustion researchers because it means that particle morphology carries with it information on the distribution of soot formation conditions in flames.

Biography

Rogak is an expert on aerosol measurements and emissions. His focus has been on soot and nanoparticle emissions from combustion sources, as these are the particles most implicated in the human health impacts of air pollution. Human exposure to airborne contaminants is typically highest indoors, and this concern has led to research on transport of cough and sneeze particles (with Dr. Amir Aliabadi at University of Guelph), filtration (with Dr. James Montgomery) and the degradation of HVAC equipment from air pollution (with the dPoint-Zehnder-UBC collaborative project). Professor Rogak is author of more than 70 peer reviewed papers on aerosols, is currently a member of the Editorial Advisory Board for Aerosol Science and Technology, and is on the Scientific Advisory Committee for FlareNet, a Canadian network of researchers quantifying the emissions from oil and gas production flaring emissions. Recent work has focused on the discovery that soot seems to retain structures that correspond to inhomogeneous regions within flames.

rogak@mech.ubc.ca

Notes: