

Abstract Submitted
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Preparation and Characterization of Highly Insulating Granular Samples for Electron Yield Measurements HEATHER ALLEN, THOMAS KEATON, JR DENNISON, Utah State University, MATERIALS PHYSICS GROUP TEAM — Methods to prepare and characterize highly insulating particulate samples for electron yield measurements were developed and evaluated. Accurate analysis methods were required to characterize particle size and shape and the magnitude and uniformity of fractional particle coverage. Optical microscopy had insufficient resolution and contrast to fully differentiate the highly-insulating, granular, 68 m mean sized, Al_2O_3 particulates mounted on substrates of standard scanning electron microscopy (SEM) graphitic carbon tape with acrylic-based conductive adhesive. Modest resolution SEM images were used instead and also provided spatial information of occasional charging of Al_2O_3 particles. A custom MATLAB script analyzed SEM images numerical greyscale pixel values to determine allowing global and regional fractional coverages; commercial software was less effective. Gravimetric deposition of particles suspended in deionized water onto adhesive substrates was the most successful preparation method; loose particulates were removed with nitrogen gas jets. Application of other particulate shapes, sizes, and 0% to ~100% coverages are discussed, as are less successful preparation methods. Representative electron yield measurements are presented.

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