

Fall 2018 Four Corner Section Meeting of the
American Physical Society



University of Utah
Salt Lake City, UT
October 12-13, 2018

***An Analysis of Variations in Published Secondary Electron
Yield Measurements of Copper ****

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Abstract

Secondary Electron Yield (SEY) is a critical material property that has had many different values reported in scientific literature for specific elements and compounds. SEY gauges the number of emitted electrons per incident electron and is a basic material property that is of critical importance for many physics-based applications. A study has been conducted on copper to identify the relative importance and origins of variations of SEY vs. incident energy curves. Variations may result from or be attributed to: bulk composition and impurities, surface modification (including roughness, oxidation, and contamination); sample modification (including thermal annealing and ion sputtering); sample charging; instrumentation effects (including collector efficiency and stray fields); and absolute calibrations techniques. Agreement between the various curves for copper found in the literature, is underwhelming, with a variation of ~60% observed. These results support the need to develop a detailed database of electron yield curves that include, where available, pertinent materials and background information for each study.

* Supported through a USU Physics Department Blood/Taylor graduate fellowship.

Phil Lundgreen and J.R. Dennison, "An Analysis of Variations in Published Secondary Electron Yield Measurements of Copper," *American Physical Society Four Corners Meeting*, University of Utah, Salt Lake City, UT, October 12-13, 2018.