
Multidimensional depth profile analysis of Plasma Coatings by Plasma Profiling Techniques, GD OES and PP TOFMS

Patrick Chapon*¹, Celia Olivero , Agnes Tempez , and Sébastien Legendre

¹Horiba Jobin Yvon (HJY) – Horiba Scie – 16-18 rue du canal 91165 Longjumeau, France

Abstract

Presentation of Analytical Plasma Profiling Techniques, namely Glow Discharge OES and TOFMS, for thin and thick film characterisation, These techniques rely on the fast sputtering of a representative area of the material of interest by a high density ($10^{14}/\text{cm}^3$) and low energy plasma.

The unique characteristics of this plasma allow very fast erosion (2-10nm/s) with minimum surface damage (as the incident particles have an average energy of about 50eV) and it has been shown that it can be used advantageously for sample preparation in SEM.

Various applications will be presented ranging from thin/thick film analysis for composition, contamination detection and doping level measurement to the characterization of diffusion mechanisms through isotopic depth profiles. With OES detection, Deuterium (D) mainly has been measured; with TOFMS all isotopes are readily available.

Aspects of analytical performance with regards to sensitivity, quantification, surface roughness, repeatability and sample throughput will be discussed.

Keywords: Depth Profiling, GD plasmas, OES, TOFMS

*Speaker