

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

The role of oxygen in analytical glow discharges: GD-OES and GD-ToF-MS studies SOHAIL MUSHTAQ, JULIET C. PICKERING, Imperial College London, EDWARD B.M. STEERS, London Metropolitan University, PETER HORVATH, JAMES A. WHITBY, JOHANN MICHLER, EMPA - Swiss Federal Laboratories for Materials Science & Technology, Thun — The influence of up to 0.8 % O₂ on the Ar plasma in a dc analytical glow discharge was studied on Fe, Ti, Cu and Au samples using time of flight mass spectrometry and high resolution optical Fourier transform spectrometry. All positive ion signals decreased gradually by 2 to 3 orders of magnitude with increasing O₂. In addition, a sudden 100-fold drop of the ion signals also occurred for Fe and Ti samples at 0.1 % and 0.05 % O₂ concentrations, respectively. Optical emission spectra of Fe I, Fe II, Ti I and Ti II in Ar/O₂ plasmas also showed a sudden drop of intensity at the same concentrations. This was accompanied by a 20-fold drop in sputter rate for Fe and Ti, whereas the sputter rate changed less for Cu and only slightly for Au. The role of surface and gas-phase processes will be discussed in the presentation.

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Date submitted: 16 Jul 2010

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