

Analytical Glow Discharges – Quantification and Other Challenges

M. Kasik

EAG Shiva, Syracuse, USA

Producing a numeric value from a measurement is the fundament of the “game” in Analytical Glow Discharge applications. In addition, this numeric value is expected to be determined with good precision, reproducibility, and accuracy.

Generally the following two main ionization processes are dominating the ionizations of atoms and/or atomized species in analytical glow discharges: the electron impact ionization (consequence of fast electrons) and the ionizations via metastable discharge atoms. Here we are proposing a simplified model to examine the effects of changes in populations of discharge ions versus metastable atoms on the calibration parameters. Despite a quite simplified approach, the observed results, using Argon as the discharge gas, indicate very good agreements with observations. Furthermore, this simplified model can help developing more efficient calibration methods and/or better Relative Sensitivity Factors, which are used for quantification of results in glow discharge based techniques.